

THE IRON AGE

THURSDAY, FEBRUARY 16, 1893.

A Steel Furnace Hearth Casing.

M. Boivin reports in the *Comptes Rendus* of the Société de l'Industrie Minérale a casing for a furnace hearth, which has been used at Firminy. The hearth of this furnace, which is 5.9 feet inside diameter, has a wall 35 inches thick, made up of 9.8 inches of inside brick work, a middle rammed lining of 19.7 inches, and an outside casing 5.9 inches of cast steel. The latter is 8.53 feet high from the bottom of the boshes to the ground, about one half of it being below the level of the hearth bottom, and is built up in rings formed of

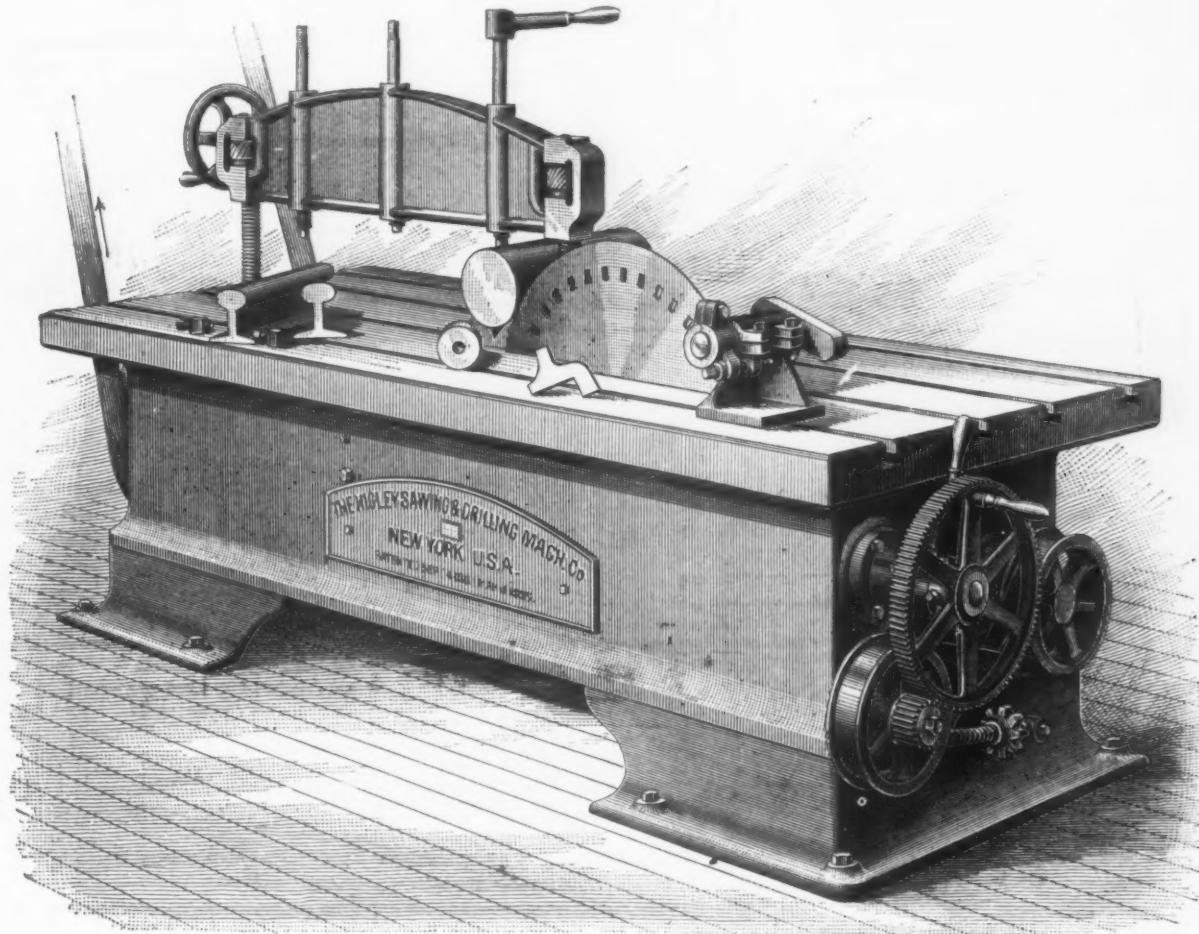
sides and corners of the plates; the whole structure being further strengthened by outside hoops connected to the upright pillars. The weight of the casing is about 27 tons. It is cooled by water constantly flowing over the outside.

The furnace was lighted on the evening of November 20, 1891, and in the first 100 days' blowing made 8004 tons of pig iron and about 70 per cent. of that weight of cinder, or a total of 13,600 tons of molten material, or 136 tons per day. For about a fortnight the make rose to between 100 and 107 tons, with 80 per cent. of cinder, or 180 to 190 tons melted per day.

413,000 pounds for the weight of such a line as ordinarily constructed. The completion of this line is regarded as an event of considerable commercial importance.

The Higley Cold Saw.

The accompanying engravings represent a machine for sawing merchant iron and steel of any description, and also for such work as slabbing, cutting out sections of crank shafts, as a metal slitter for deep cuts, &c. The main improvement in this machine is found in the method of driving the saw. It is claimed that this



THE HIGLEY COLD SAW.

segments somewhat like those of a pit tubing. The rings are not complete circles, a space of 27.6 inches formed by two upright pillars being left on the tap-hole side, which is filled with refractory materials, to allow the tapping level to be varied if necessary. The segments, made of annealed cast steel, are 3.28 feet long, 18.9 inches high and 5.9 inches thick; their average weight is about 10 cwt., each one having a perforated lug projecting in the center for convenience of handling. When built up they are in contact on the inside to a depth of 1.6 inches, the outer edges being shaped to form a groove of 1.2 inches maximum width, which is filled with clay, covered with a packing of asbestos, clamped by the flat side of a piece of iron tee-bar covering the joint. The separate segments are connected by wrought-iron rings, which rest in grooves of a corresponding shape formed in the

Careful measurements have shown that there is no distortion in the shape of the casing, but judging from the large volume of material run from the hearth, the interior lining has to a great extent disappeared. From 30 to 33 tons of metal, and 5 or 6 tons of cinder, are considered as a minimum quantity at each tapping.

A long-distance telephone line between Boston and Chicago was formally opened February 7 by Hon. Wm. E. Russell, Governor of Massachusetts. The line is 1200 miles in length and is strung on 54,000 poles, an average of about 45 per mile. Owing to the great distance to be covered, a special experimental circuit, consisting of two No. 8 hard-drawn copper wires, has been constructed. This wire weighs 435 pounds to the mile, and the circuit therefore contains 1,044,000 pounds of copper, as compared with about

construction permits the use of a thinner saw than is possible with the old way of mounting the saw on an arbor and conveying the power through the arbor to the saw.

The perspective view shows the clamping device, which consists of a heavy beam placed upon two upright screws, one threaded right and the other left hand. The nuts on these screws are operated by the hand wheel shown at the left, and which is mounted on a shaft provided with suitable gears for engaging the nuts. The beam is also furnished with three clamping screws, arranged as shown. The bed of the machine is formed with four T-slots, extending its entire length. The feeding mechanism is shown very plainly in the end view, Fig. 8. A is the bed and B is the power shaft, journaled in bearings in both ends of the bed. The driving pulley is mounted on this

shaft, on the end opposite the feeding device. On this shaft is placed the flanged pulley C, which is belted to the pulley D placed upon the hub of the pinion E on the feed screw G.

The pulley D and the pinion E run loosely on a stud on the arm M, which is fitted over an eccentric, N, also on the screw G.

Now, it will be understood that when the saw meets with an obstruction of any sort, it will arrest the rotation of the feed screw and gear F, and cause the pinion to roll backward on the gear F and thereby diminish the distance between the centers of pulleys C and D, when the belt will slip under the pressure of the spring I, which is pivoted to the bed at O. By

R, which travels in ways under the table. The method of driving the saw is by applying the power to the blade at almost its periphery by the steel sprocket Q engaging in the radial slots of the proper division in the blade, thereby applying the power more directly and not through the spindle, which necessarily should be heavy, but which in this case is only a bush or a light spindle.

The saw has a center bush X and wearing plates at W. The guard V has one side beveled and adjusted by set screw to bear against the saw, and the other side made to receive and allow the sprocket to pass, but hold the saw in place and against the plate W, thereby holding it rigid and straight as a guide.

The Bates Process in England.

For the past twelve months the process invented by Francis G. Bates of Philadelphia has been under searching practical trial in England, two 20-ton furnaces having been erected for this purpose at the Phoenix Engineering Works, Stoke-on-Trent. Each of these furnaces is 12 feet high by 12 feet wide and 16 feet deep from front to back. *Iron* reports as follows: A number of charges, amounting to many tons of steel, have been treated by Renshaw & Son, the proprietors of the Phoenix Works, and they have used the steel so converted for making turning tools, punches and chisels, which they have

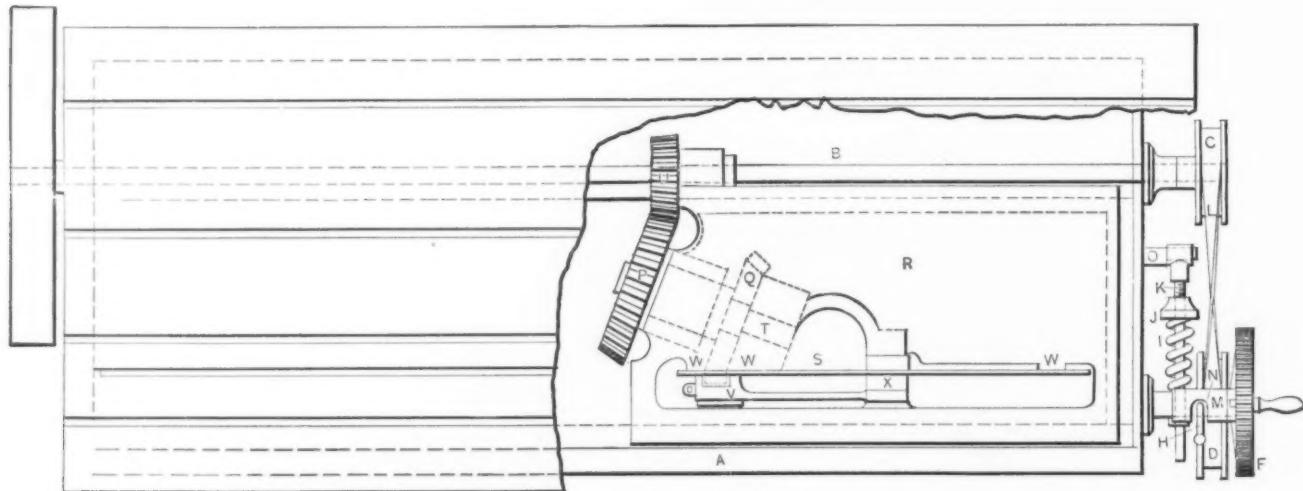


Fig. 2.—Sectional Plan.

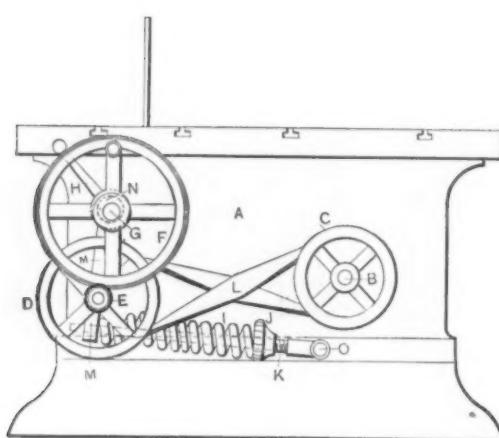


Fig. 3.—End Elevation.

THE HIGLEY COLD SAW.

the aid of the adjusting nut J and screw (K which is also the center of spring I) the pressure under which the saw operates can be adjusted at will.

What is claimed for this mechanism is that it is automatic in feeding in light or heavy cuts, or cuts of irregular shapes; the saw being under a pressure set at will, it will remove a given amount of metal per minute. For instance, if the stock to be cut is a T-rail or an I-beam the saw will cut through the web of rail fast, and as it meets the head it will feed under the pressure due to the resistance of the larger section of beam or rail, cutting a given amount of metal in the same length of time.

Figs. 2 and 4 show the power shaft B, to which is spined the bevelled pinion U which engages with the large gear P, upon the shaft of which is mounted the sprocket wheel Q driving the saw S, this mechanism being carried by the carriage

The capacity of this machine is 8 x 36 inches, or it will cut off a piece 8 inches high and 36 inches long. The driving pulley is 24 inches x 6 inches face and is intended to make 70 revolutions per minute. The weight is 4500 pounds.

This saw is made by the Higley Sawing & Drilling Machine Company of 129 Worth street, New York.

Ohio's labor statistician, W. T. Lewis, reports for 1892 that "15,599 miners were paid \$5,455,272.17 for mining 7,617,717 tons, making the average wages of pick mining \$349.72, and the average tonnage per miner 488. The average number of days worked per miner was 196½."

The first message sent through the pneumatic tube from the post office in Philadelphia on Saturday proved the feasibility of the system.

employed in their own establishment on general work with unqualified success. Beyond this Messrs. Renshaw have supplied the proprietors of other engineering works with bars of the converted steel which have been made into tools, and tested in use by them, and reported upon most satisfactorily. Some of the writers of those favorable reports show themselves to possess the courage of their opinions by stating that they are prepared to enter into contracts for the purchase of Bates steel. The invention is in the control of the Bates Steel Syndicate of Queen Anne's Mansions, St. Clement's House, London, for whom Perry F. Nursey has carried out trials with various brands of low-grade steel, that is, steel containing about 0.8 or 0.9 of carbon. Among others, Bessemer; Brown, Bayley; Glengarnock basic, and Brymbo steels have been converted by the Bates process under Mr. Nursey's inspection, and various kinds of tools have

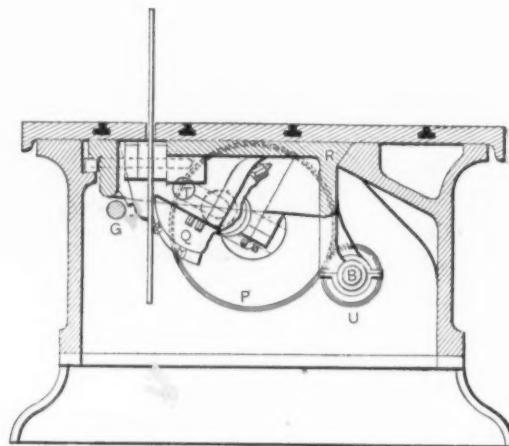


Fig. 4.—Cross Section.

been made from the converted bars and tested by him in ordinary work.

According to Mr. Nursey's report, the tools consisted of turning tools and punches, both round and square. Of these a turning tool was put to work to re-dress the tire of a well-traveled car wheel, the skin of which was very hard and dense owing to heavy use. The tool made very light work of it, taking two good cuts off the tread without regrounding. Another similar tool was put to a car wheel with a still denser skin, as the turnings showed, and it took $5\frac{1}{2}$ inches off the tread and flange before it required regrounding. As regards the punches, a number of these, both round and square, were tried with the best results. Some of the rounds were set to punch plates equaling and exceeding

costs, on the average £7. 5/ per ton, and its selling price will probably be about £2. 16/ per hundredweight, or £56 per ton.

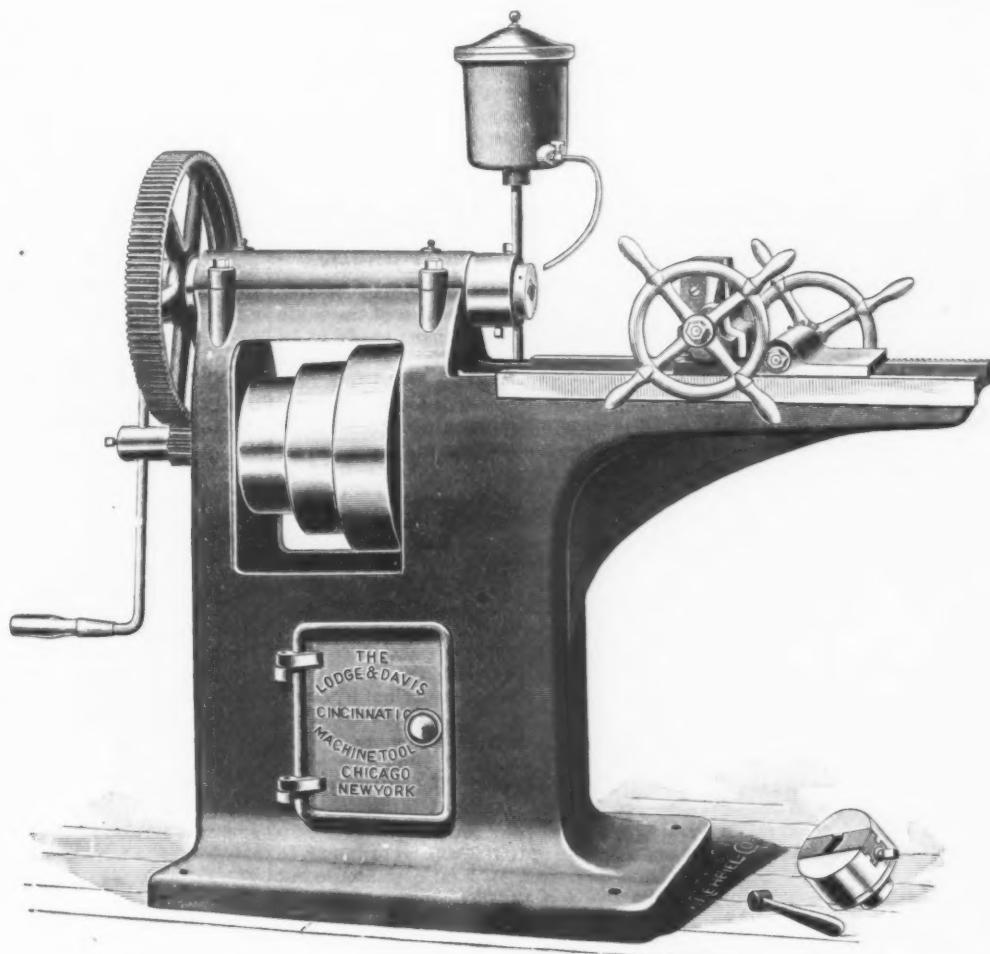
The Lodge & Davis Bolt Cutter and Nut Tapper.

It will be seen by the illustration that this machine is designed for hard and continuous service. The entire frame is cast in one piece, making a very rigid and stiff construction. The cone pulley has three steps for a 3-inch belt, the largest one being 13 inches in diameter. The machine is geared $6\frac{1}{2}$ to 1, the large driving gear being 17 inches in diameter. All gears and rack are cut from the solid metal.

Belgian Iron Production and Wages.—The following figures show the production of iron and coal in Belgium during the year 1891. There were 19 works engaged in the production of pig iron, with 28 blast furnaces and 2827 men, receiving an average pay of 2.85 francs (56 cents) per day. Production was:

	Value per ton.	
	Tons.	Francs.
Forge pig.....	445,436	50.91
Foundry pig.....	56,241	58.91
Bessemer.....	147,913	70.04
Basic.....	34,536	56.98
Total, 1891.....	684,126	56.01
Total, 1890	787,836	63.56

Manufactured iron was produced in 64 works, with 16,227 men receiving an aver-



SOLID-DIE BOLT CUTTER AND NUT TAPPER.

in thickness their own diameters, and they accomplished their work most satisfactorily. A very important point here arises as to what amount of work tools made from the same steel before conversion would do. In order, therefore, to institute a comparison between the behavior of the steel before and after treatment by the Bates process, a tool was made from the untreated portion of the bar from which the tool last referred to was made. It was put to work on a softer wheel than the companion treated tool, but gave out in a very few minutes. The same thing occurred with a tool made from the untreated portion of another bar, the tool made from the treated portion doing excellent work. It will at once be admitted that the tests of the converted steel were of a crucial character, for we need hardly point out that work such as these turning tools did is always done by tools of Musket steel. This steel costs £7 per hundredweight, or £140 per ton, while the steel converted and tested by Mr. Nursey

The spindle is of generous proportions and has a $1\frac{1}{2}$ inch hole through it. A reservoir is provided, so that the dies may be well lubricated to prevent cutting. The carriage can be fed 16 inches in length and the vise is fitted with tool-steel jaws. In addition to belt power, this machine is run by hand, which is very convenient in case of a breakdown. The hand motion requires comparatively little exertion on the part of the operator. Each die is complete with collet and is capable of perfect adjustment. This die is particularly solid and is so designed as not to strip the threads. Each machine is complete as follows:

$\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{5}{16}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ dies, with collets; set of taps as per dies; two-jaw tap chuck.

The countershaft has tight and loose pulleys, 12 inches diameter for $3\frac{1}{2}$ inch belt, and should run 350 revolutions per minute. The machine is built by the Lodge & Davis Machine Tool Company, Cincinnati, Ohio.

age pay of 3.17 francs (62 cents) per day. Of the iron used, 494,811 tons were from inland and 51,526 tons from abroad. Total production of bars, girders, plates, sheets and rails was 497,380 tons, worth 145.42 francs per ton, against 514,311 tons, worth 161.36 francs per ton in 1890. Steel was produced on 29 works, employing 3124 men. Average pay was 3.48 francs (68 cents) per day. For the steel manufacture 197,118 tons inland and 46,650 tons foreign iron was consumed. The total production of the steel works was 206,305 tons, worth 141.11 francs, against 201,817 tons, worth 154.98 francs, in 1890.

The publication formerly known as *Reciprocity*, issued by Burk & McFetridge of Philadelphia, will hereafter be published under the name of *Traffic*. The publishers state that a change of name was considered desirable owing to the political significance which has been given to the subject of reciprocity.

WORLD'S FAIR NOTES.

Cold Weather Retards Progress.

The big Manufactures Building is a busy place these days. Between 200 and 300 carpenters are at work erecting the booths. It is somewhat odd that foreign exhibitors are about the first on the ground. Some 60 carpenters more are engaged in constructing the additions to the galleries across the pavilions. The floor space in the building is being increased in this way by nearly two acres.

The booths of the great European powers are really large buildings. In any other structure on the grounds they would look out of proportion, but under that great arch they are not over large. The great clock tower is up to the second story. The French Building is boarded up on the inside. The booth of Doulton & Co., the English potters, is going ahead rapidly. The skeleton frame was shipped from England, but the rest is being made by Chicago firms. Sage & Co., the London cabinet makers, have another booth near by nicely started. It was shipped ready to be put together. Forty carpenters are employed on the Tiffany Building, and five Japanese workmen have their structure so far along that it can be said to be a rival in tastiness to any other which may be erected hereafter. All these are under the main arch. New South Wales is building its booth in the west pavilion gallery. At times the sounds of the hammers become merged in one grand roar.

The guards say that during the cold spell it was colder in the building than out of doors. By March 1 the vast space will be well broken and a good idea of the way the Manufactures Building will look can be obtained.

Among the State buildings the cold weather was much more disastrous to construction than elsewhere on the grounds. In the great California Building the force was at one time reduced to three lathers. A solitary painter on Wednesday was trying to cover the wide expanse of the Michigan Building's exterior. He was the sole survivor of a large gang, which had dropped off one by one. Two carpenters were engaged on the Indiana Building. They were cold, extremely cold. Work was entirely suspended on the Washington State Building. A few men were engaged in finishing work at the other State buildings.

After a brave endeavor the contractors for the Illinois Building completed that structure and withdrew their last workmen Wednesday. The State Board examined the structure and probably will accept it. The cold added greatly to the cost of the interior decorations.

Work has not stopped for a day all winter on the Live Stock Pavilion. It was all outdoor work, and the frozen ears, noses, fingers and toes if collected would make a fine anatomical museum.

After a heroic struggle with the cold the construction gang on the electric elevated road surrendered a fortnight ago. It was hoped that the road could be placed in running order by April 1 in order to reap a good revenue from the large fair population of that month, but the delay will prevent the operation of the road until nearly the time for opening the fair. The contractors will put every man available on its construction at the earliest date.

The carpenters kept things moving at the railway station until a few days ago. Finally they called off from the unequal contest until frozen fingers were not so common.

The greatest center of attraction at this time is undoubtedly Machinery Hall. There one hears the greatest amount of noise, finds the most activity, and sees by

far the largest number of laborers at work. Every day there are 350 masons, shovellers, dirt wheelers, and all-around handy men employed on the construction of foundations for heavy machinery that is to be used in the power plant of the great exposition. The scene is both interesting and exciting. Inquiry among some of the foremen and superintendents elicited the information that while this particular department is well advanced there is yet sufficient work before them to keep large gangs going night and day in order to get out of the way of other forces coming on soon to place the machinery and put it together.

Taking into consideration the fact that nothing has ever been attempted in the way of a plan for furnishing steam and compressed air power that can be compared to this display, and only 80 days still remain in which to complete it, great activity is an absolute necessity. The plant covers a space 1100 feet in length by about 150 feet in width, exclusive of the space taken up by the boilers in an annex to the main building. The ground dimension of that entire area is being excavated to a depth of 10 feet below the floor surface and filled almost solidly with stone and brick masonry on which the engines will be placed and bolted down.

Topographical Map of Illinois.

An accurate topographical map of Illinois, made under the direction of the State World's Fair Board, is almost ready to be sent to the Illinois Building at Jackson Park. A prominent place in the building has been reserved for it, because it is believed to be the only map of the State in existence that is anywhere near correct. C. W. Rolfe, who collected the data used in making the map, says that on the best map of Illinois ever published 1382 important corrections have been made. These corrections refer chiefly to the location of railroad stations, the length and course of streams, the location of lakes and their number, the position of railroad lines and the boundaries of counties and the State line. Of course some of the corrections would not be considered important by many people, while the importance of other changes would be recognized at once. One town was found 18 miles from the place the maps located it and 12 streams were discovered to be running in directions exactly opposite the course indicated on standard maps; 193 towns were found to be from a quarter of a mile to a mile out of the way and 43 were from 3 to 7 miles from the places fixed on regular maps for them.

The map prepared by Mr. Rolfe is to be one of the big things of the Illinois show. It is 10 feet wide and 16 feet long, modeled in clay. A number of experts at the University of Illinois are just putting the finishing touches on it. The map will cost \$15,000. Engineering corps were put in the field more than a year ago to collect data. Mr. Rolfe realized the need of taking advantage of all the data that had previously been gathered, and in doing this he saved great expense.

Some years ago a committee of the Western Society of Engineers reported that an appropriation of \$20,000 a year for 56 years, or \$1,120,000 in all, would be required to make an accurate topographical map of the State. Mr. Rolfe and his assistants used the data collected by the Mississippi River Commission, which included a line of levels from Cairo to Dunleith; a line of levels from Fulton to Chicago along the St. Paul Railroad, and a series of topographical charts of the Illinois share of the Mississippi and the low water slope of the Mississippi. From the lake survey he got a series of geodetic stations between Chicago and Olney. The Canal Commission furnished data of low water levels of the Illinois River. Topographic

charts of the country between Chicago and Peoria were secured from the United States Geologic Survey and a line of levels from Olney to St. Louis and from Centralia to Cairo, with low water levels of the Ohio and Wabash rivers, were furnished by the Coast and Geodetic Survey.

These statistics were supplemented by data of the preliminary survey of the Hennepin Canal and profiles of every railway line in the State. The exact relations of the railroads at intersecting points were ascertained, and the profiles of the roads checked on each other, using those that had been corrected by United States data as master systems. To the outline so established, the details of the surface were added by traverses, with barometer and hand level, arranged to intersect railroads as often as possible, and practically to bring the observer within sight of every section of land in his district. Prominent points, either of elevation or depression, were visited and observations made upon them. Many cross checks and other means of correction were applied to overcome errors in atmospheric pressure, instrumental irregularities and errors of observation.

Finally, the results obtained were expressed in contour lines on the maps. Care was taken to make the maps more correct in their horizontal features than any heretofore published. The locations of towns and courses of streams were in most cases either verified or corrected.

This great map will show the precise location of every town and railway station in the State, the position of all the public buildings and State institutions and township and county boundaries.

Rules for Placing Exhibits.

Director-General Davis and Director of Works Burnham have agreed upon a set of rules for the government of exhibitors in the matter of installing exhibits. It is desired that the installation shall be artistic and harmonious throughout. Cheap arrangements will not be permitted, and designs must prove satisfactory to the Director of Works and the several chiefs of departments. The regulations, which are of interest to every intending exhibitor, are as follows:

Method of procedure when an exhibitor wishes approval of designs, location and style of foundations, sort and arrangement of lights, power, sewerage, water, gas, &c.:

1. Exhibitors shall submit full drawings, specifications and details to the chief of department in which the exhibit is to be installed, together with his address and office hours, and agree to hold himself ready during the following 48 hours to meet and further explain such drawings, specifications and details to those engineers whom it may be necessary to consult.

2. The chief of department shall thereupon be charged with obtaining approval from the Director of Works or his assistant of the drawings, specifications and details submitted so far as it shall be necessary to do so.

3. The chief of each department shall have a fixed hour before noon each day in which to see exhibitors, and the drawings and information necessary shall be sent to the Director of Works by or before 12 o'clock each day.

4. The Director of Works shall have a special secretary to attend solely to this work, who shall have special quarters at the Service Building in Room 18.

5. Such engineers and architects under the Director of Works as may be called on to pass upon matters for exhibitors pertaining to designs, construction, water, gas, mechanical and electrical engineering, &c., shall meet each week day at 1 o'clock p.m., in the office of said secretary, and shall pass upon all matters submitted in this behalf, and on the blanks provided for the purpose their findings in each case shall be recorded and at once signed by the Director of Works or his assistant and transmitted to the chief of the department whence it originated.

6. The chief of the department shall thereupon at once issue the permit to said exhibitor and he shall be allowed to proceed in accordance with its terms.

7. Exhibitors will furnish such duplicate plans, drawings or specifications as may be required by the Director of Works.

Stockholders are Paying Up Well.

Exposition stockholders have paid up well. In his report to the Board of Directors yesterday Auditor Ackerman showed that on 597,650 shares of stock of the value of \$10 each \$5,509,767 have been paid, leaving an unpaid residue of \$466,733, or approximately 7.8 per cent. of the whole.

According to Treasurer Seeberger's monthly report, there is a balance in the treasury of \$573,879. His report shows further that from the sale of souvenir coins \$836,438 has been received, as well as premiums on the same amounting to \$10,000. This applies to the coin secured by the Remington people. The total disbursements and receipts are set forth by Treasurer Seeberger as follows:

Balance received from temporary organization.....	\$4,252.64
Received on current installments of stock subscriptions.....	5,423,496.20
Received from banks, interest on deposits to January 31.....	65,368.53
Received from City of Chicago account sale of bonds.....	5,003,726.06
Received for souvenir coins.....	836,438.00
Received for premium on souvenir coins.....	10,022.23
Amount of gate receipts at Jackson Park to February 8.....	193,093.26
Received account debenture bonds.....	3,617,500.00
Received account accrued interest on debenture bonds.....	16,866.61
Miscellaneous receipts from sundry sources.....	351,672.82
Received various stock subscriptions not yet classified.....	108.40
Received from various deposits on contracts, being amount on hand to credit of escrow account.....	79,000.00
Received from Dept. Public Comfort.....	1,875.00
Total.....	\$15,603,419.80

DISBURSEMENTS.

Total disbursements on vouchers, as per daily report to auditor.....	\$15,029,539.97
Total cash on hand.....	573,879.83

Total.....	\$15,603,419.80
------------	-----------------

And Again the Boiler Suit.

The famous boiler contest has taken a new turn and now the advantage of the situation seems to rest with the Stirling Boiler Company. After the Master in Chancery, Winchester, filed a report in which he recommended an injunction restraining the fair management from allowing the Stirling Boiler Company to put its boilers in the space allotted to the Babcock & Wilcox Company, and also recommended that the court compel a specific performance of the contract between the Babcock Company and the World's Fair, the attorney for the latter asked on the 6th inst. to be allowed to remove the case from the local court to the United States Circuit Court. After a sharp contest between counsel the court granted the request. And now it is thought that a hearing can hardly be secured in time to do the Babcock & Wilcox Company any good, as the matter will have to take its turn and may not be called up until next year. In the meantime the Stirling boilers will be set in place and the exposition will have run its course.

MISCELLANEOUS.

The Hon. E. H. Conger, United States Minister to the Republic of Brazil, writes Chief Walker Fearn of the Foreign Affairs Department, that the preparatory exhibition at Rio Janeiro of articles intended for the World's Fair was officially and successfully inaugurated in that city in January. The diplomatic corps were all present and were given posts of honor. The display was a marvelous one and surprised every one who witnessed it. The old National Museum was entirely cleared and the space was filled to overflowing. More than 500 packages were necessarily left unpacked at

the docks, and many of the State exhibits will go direct to Chicago.

The Bethlehem Iron Company are erecting scaffolding preparatory to placing a duplicate in staff of the great hammer employed in the works of that company.

The Lunkenheimer Piston Whistle.

A variable sound steam whistle especially adapted for engines, factory, mill use, &c., has been brought out by the Lunkenheimer Company of Cincinnati. It is attached like an ordinary whistle. The bell is provided with a piston, V, which is pulled downward by a chain running between pulleys, and when not in use is always at the top, being drawn upward by means of a spring, M. All that is necessary, in order to change the sound, is to pull the chain. The dome shaped bell, A, is securely supported at its base by a three-armed prong, the stem of which is adjustably screwed into the whistle base,



The Lunkenheimer Piston Whistle.

and fastened by the jam nut E. Owing to this construction the lower edge of the bell is always exactly in line with the slot in the base through which the steam escapes, thereby securing a loud, clear and perfect tone.

Public confidence in the credit of the general Government in this country at the present time is literally worth more than gold, for the percentage of business transactions effected by actual money is so small that in the absence of confidence there is neither gold nor silver enough to take the place of the ordinary forms of business. Speaking on this subject, in a recent interview, Secretary Foster said: "The proportion of coin used in the transactions of the bank of France in 1886 was but 4½ per cent., bank notes and other instruments of credit forming the other 95½ per cent. The Bank of England, in a daily average business of \$22,000,000, handled one-quarter of 1 per cent. in coin, 87½ per cent. in checks and drafts, and 12½ in bank notes. The balances of the New York Clearing house paid in money in the past 39 years averaged less than 5 per cent. An examination of the business of the

national banks on a given day last September showed that less than 10 per cent. of the transactions of that day were represented by cash. Forms of credit do the bulk of the work."

Labor in England.

Robert Giffen, the well-known statistician, was called upon to testify before the Royal Commission on Labor as the assistant secretary to the Board of Trade. His remarks are reported as follows in an English paper:

The great bulk of the working classes in general employment were shown by the statistics collected to receive an average wage of between 20 shillings and 30 shillings a week. A large number were paid over 30 shillings, and about 25 per cent. under 20 shillings a week. Statistics of domestic service had not yet been touched in the tables, although such employment engaged from a third to a half of all women and girls earning their livelihood. The average remuneration of women in non-domestic service was £32 a year, while the remuneration in domestic employment was nearer £50. The average earnings of manual labor were: For men, about £60 per annum; for women, about £40; for lads and boys, £23.8, and for girls, £23. The aggregate earnings of manual labor were about £630,000,000, as compared with £640,000,000, the amount earned by the other classes of labor and coming within the income tax. Fifty years ago half our working population consisted of agricultural laborers, and their work was paid for at a low rate. At the present time less than one-fifth of the population were agricultural laborers. This substitution of better paid for worse paid employments, and possibly the depreciation of money since 1850, had improved the mass. The greater part of the rise in wages occurred before 1872. There had been a great fall since, probably of from 25 to 30 per cent., but as compared with 50 years ago wages were now much higher. He was of opinion that the statistics as to strikes ought to mitigate the impression with respect to the seriousness of the mischief occasioned by strikes. The loss of wages caused by strikes did not amount to more than a fraction of 1 per cent. of the total wage earnings of the community; he believed it was about one-fourth or one-fifth of 1 per cent. The average duration of strikes was about three weeks. When a strike lasted for a shorter period than three weeks it did not follow that, although the wages were suspended for that period, the workmen concerned would at the end of the year have received three weeks' wages less than they would otherwise have obtained, inasmuch as three weeks' idleness could in many trades be made up at other times. Under these circumstances the total loss of wages occasioned by strikes would be even smaller than he had stated. He thought, therefore, that the directly bad effects of strikes might have been somewhat exaggerated. He considered, however, that strikes had indirect effects which were very important, such, for instance, as the loss of some particular trade with which there was foreign competition. The total membership of trades unions was 871,000 out of a total adult population of 7,250,000, and the annual income was nearly £1,200,000, or about 27 shillings and 6 pence per head of the members.

Lake ships still continue to pay about 25 per cent. on the capital invested in them, says President John Craig of the Craig Shipbuilding Company of Toledo, Ohio, and so long as this continues shipbuilding in the Northwest will prosper. All the largest new vessels are being built of steel.

The Priestman Engine as Made in America.

In December last, Coleman Sellers read a paper on the "Priestman Engine," before the Franklin Institute,* from which we take the following extracts:

Petroleum Engines.

In 1890, while in London, I found Prof. William Cawthorne Unwin, B. Sc., F. R. S., interested in his tests of a few internal combustion or explosion motors, using petroleum as fuel, which had been exhibited

Professor Unwin's tests of consumption of oil by the Priestman engine, tried by him in England, extended over a considerable time, and he made these tests upon several different engines. In the tabulated results he gives the relative values of coal oil and coals as heat makers and their ability to yield power, the one, coal oil, applying its heat to air by internal combustion, the coal being burned under a boiler to make the steam that operates a steam engine.

He states that it may be assumed that 1 pound of oil is thermally equivalent to $1\frac{1}{2}$ pounds of coal; so that 0.946 pound of oil equals 1.18 of coal, 0.988 oil equals

what may be considered the cost in actual use without any of the careful attention that always accomplishes trial runs with all conditions favorable. In one case, when an engine yielding 8.25 brake horsepower was run for two hours at full load, the engine being set up in an open shed, in very cold weather, with all conditions unfavorable, the oil consumption amounted to 1.159 pounds per horse-power per hour, the oil costing a little over 4 cents per gallon (say 5 cents per gallon), and was of a density of 0.781; 1 cubic inch of this oil weighing 0.028116 pounds. As 231 cubic inches, or 1 United States gallon, costs (say) 5 cents,

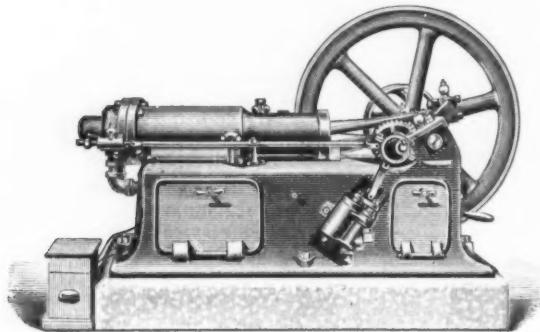


Fig. 1.—English Design.

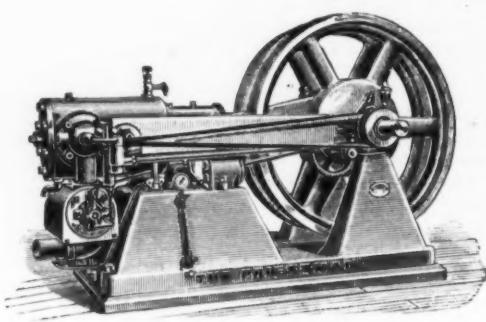


Fig. 2.—American Design.

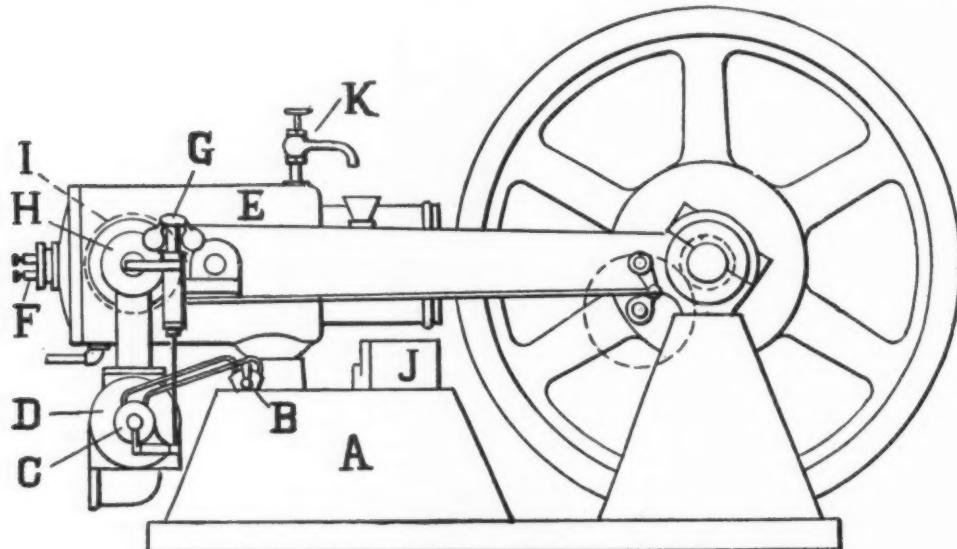


Fig. 3.—Diagram Showing Operation of Engine.

THE PRIESTMAN ENGINE AS MADE IN AMERICA.

at the Royal Agricultural Society's Show at Plymouth, in 1889. He called my attention to the fact that among those exhibited, the Priestman engine, Fig. 1, not only had worked well, but in cost of running, a small engine of less than 10 horse-power compared favorably with the best results that had been obtained from steam in large low-pressure engines under the most favorable conditions, the price of coal oil being in England in excess of its price in America.

On March 8, 1892, Professor Unwin read a paper on "Petroleum Engines" before the Institution of Civil Engineers, at 25 Great George street, London. This paper, dwelling mainly on the Priestman engine, is so exhaustive as to questions of economy and efficiency as to leave no room for me to present any better statement on the same subject, further than to say that I have myself tested the accuracy of many of Professor Unwin's figures. Changes since that time made in the Priestman engine, as manufactured in Philadelphia by a branch company for the American market, will be the motive in my presentation of the case now.

1.23, and 0.842 pound of oil equals 1.02 pounds of coal each per effective brake horse power hour. He cites as the lowest observed consumption of steam that a large triple-condensing Sulzer engine worked at high pressure gave a result equal to 1.61 pounds of coal per effective horse-power per hour. It is, indeed, remarkable that better results should have been obtained in an oil engine of only 5 horse power, while a steam engine of 5 horse-power would be considered very economical that would consume 3 or 4

and weighs 6.494796 pounds per gallon of this density, therefore, 1.159 of oil equals 0.008923 of \$1 (say, $\frac{1}{10}$ of 1 cent per horse-power per hour). This working at nine mills per horse-power shows that the claim usually made of assuming the cost to be 1 cent per horse power is not unreasonable and may be considered as covering oil burned in getting up heat in the mixer before the engine is started.

Professor Unwin gives a table of cost of working for fuel per hour, from which may be taken :

Cost of Fuel per Hour.

Engine.	Per effective horse-power.		
	Quantity of fuel.	Price.	Cost.
Large condensing steam engine.	2 pounds.	\$4.00 a ton.	0.36 cent.
Small non-condensing steam engine.	6 pounds.	4.00 a ton.	1.08 cents.
Gas engine.	24 cubic feet.	1.50 per M.	3.60 cents.
Priestman engine.	1 pound oil.	2.38 a barrel.	0.75 cent.

pounds of coal per effective horse-power per hour.

I have verified Professor Unwin's figures and have made several tests of consumption under unfavorable conditions to get at

With us, in the experiment cited, the Priestman engine was run at the cost of 0.89 cent per hour. It must be borne in mind, however, that in a steam engine the cost of the stoker must be added, and

* Published in the *Journal of the Franklin Institute* for February, 1893.

most small steam engines use more coal than cited. There is also more fuel wasted in getting up steam or keeping up steam while standing than there is wasted in the oil engine, which requires no attention whatever while running, save to keep the oil in the tank, and when standing costs nothing.

Operation of Engine.

The following is a description of the operation of the engine, reference being had to Fig. 3 :

A, oil tank filled with any ordinary high test (usually 150° test) oil, from which oil under air pressure is forced through a pipe to the three-way cock B, and thence conveyed to the atomizer C, where the oil is met by a current of air and broken up into atoms and sprayed into the mixer D, where it is mixed with the proper proportion of supplementary air and sufficiently heated by the exhaust from the cylinder passing around this chamber. The mixture is then drawn by suction through the inlet valve I into the cylinder E, where it is compressed by the piston and ignited by an electric spark

motive holds with equal force in reference to the convenience of the American type, which is shown in Fig. 2.

When, as in the English engine, the fly wheel is placed outside of the bearings and the shock from the sudden ignition comes upon the crank, that is, between the two bearings, the bearings receive this blow with almost full intensity, while with the Sweet straight line principle the fly wheels forming part of the crank and offering their great weight to the blow between the bearings, they present a mass of sufficient inertia to neutralize the effect of the blow, and this is an illustration of the well-known case of the difference in personal comfort between endeavoring to crack a hickory nut on one's knee, with or without the intervention of a flat iron or pound weight to serve as an anvil and neutralize the blow of the hammer.

How the Petroleum is Used.

Dr. Sellers then explained that in this engine the petroleum is used as a fuel only. It is not vaporized with the aim to make a permanent gas which can act expansively,

amount of fuel burned and the amount of air that is heated by each regulated charge of fuel and air.

The Priestman engine uses for fuel common petroleum such as is burned in lamps, and the quality best suited to this purpose is just what is safest in common use; that is, the highest proof oil. This oil is ignited in combination with air under a low pressure, created by the return stroke of the piston. Some part of this air supports the combustion of the oil, and the heat generated by the combustion of the oil expands the air that remains and the products resulting from the explosion, and thus develops its power from air that it takes in while running. In other words, the engine exerts its power by inhaling air, heating that air and expelling the products of combustion when done with.

Action of Atomizer.

I can show you the action of the atomizer that is used in the Priestman engine to reduce the oil that is required for fuel into the form of dust that it may more readily be ignited, by means of the piece of apparatus which is used in testing certain parts of each engine and chiefly in adjusting the spray maker.

I ought here to state that a very valuable feature of this atomizer is that it is constructed so that its adjustment is not alterable or necessary to be altered in the hands of users.

By pumping air into the chamber containing oil it will press on the surface of the oil contained in the chamber, and a fine stream of oil, driven out by the air pressure, can be thrown from the nozzle, and you will observe that holding a lighted candle to this jet not only does not ignite it, but it may extinguish the flame of the candle. We now have attached to the same nozzle the device used in the engine for converting this stream of oil into finely divided particles, mixing these particles with air. The ejected oil ceases to be a solid stream; it is broken up by the counter-current air and there is a mingled spray expelled from the apparatus; in fact, a cloud of oil dust. Approach a light to this spray and it instantly ignites and burns with a roaring flame.

This spray, formed by the current of compressed air conveyed by a pipe from the air space in the oil tank, is not a gas. This can readily be proved by means of a small bottle with an opening in the side besides the usual neck of the bottle. Presenting this side opening to the spray maker, so as to catch the outgoing air and oil dust, the oil is caught in the bottle, and the air, separating from the spray, passes out through the neck of the bottle. You can readily see the action of the oil falling to the bottom of the bottle, while a taper applied to the neck where the air is escaping does not ignite the air that escapes separate from the oil. This shows that the spray is merely a mechanical mixture of oil and air, each liable to separate from the other if they are given time to come to rest.

If we were to attempt to introduce this spray into the cylinder of the engine and there ignite it we should find that the oil had passed back into the condition of solid oil, just as is done in the bottle, and ignition could not be effected by the electric spark. To prove this to be the case I will ignite the vapor by the same kind of spark from the same battery that is used with the engine to ignite the charge at each stroke. The spark ignites the spray while mixed with the air, but the same kind of spark applied to the air escaping from the bottle, as in the former experiment, produces no ignition whatever, nor will this same spark applied under the oil surface ignite the oil in its fluid condition.

To insure the divided oil and air, mixed in the proper proportion, to remain long

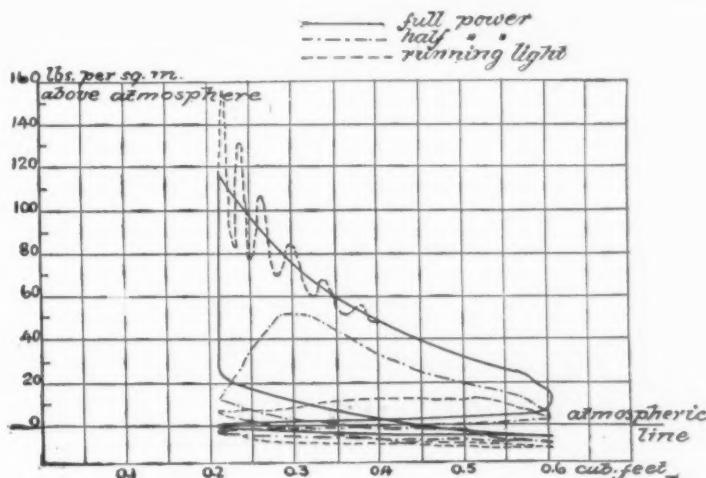


Fig. 4.—Indicator Diagram.

THE PRIESTMAN ENGINE AS MADE IN AMERICA.

passing between the points of the ignition plug F, the current for the spark being supplied from an ordinary battery furnished with the engine, the governor G controlling the supply of oil and air proportionately to the work performed. The burnt products are then discharged through the exhaust valve H, which is actuated by a cam. The inlet valve I is directly opposite the exhaust valve. The air pump J is used to maintain a small pressure in the oil tank to form the spray. K, water jacket outlet.

By this system a perfect combustion of oil takes place.

Fig. 1 shows the Priestman engine, as examined by Professor Unwin, and you will observe that it differs in no respect from the ordinary engines that are made with the cylinder and bearings attached to a massive bed plate. In this case the bed plate is made hollow and has much of the working machinery within the casting and inconvenient for repairs. Want of accessibility of the parts of the engine was the prime motive for some change in the American type, but not the only one. It is a necessity with all such machines in America that all parts shall be accessible; in fact, shall be visible and easily got at, and the changes that have been wrought in the American type of engine have been all in the direction of accessibility. It is with this engine as with the difference of American and English type of locomotive, and all that has been said in favor of the convenience of the American loco-

but it does impart heat to air and renders it capable of performing the function of a true gas under pressure.

In the first place I wish to have you clearly understand the position in which the Priestman engine stands in relation to all others using coal oil products, not only as regards its efficiency, but also as regards its absolute safety in fire risks, owing to the clever method of consuming the oil without previously converting it into a fixed gas.

This will be better understood when I mention that in the largest engines only the $\frac{1}{25}$ part of a pint of this high test oil is used at any one time, and in the smallest sizes the fuel is prepared in correct quantities varying from $\frac{1}{1000}$ of a pint upward, according to whether the engine is running on light or full duty. I think this fact alone demonstrates to a remarkable degree how wonderfully accurate are the system and devices which have been patiently worked out in the Priestman engine to have resulted in it obtaining a good name for itself, as it has done, in unskilled hands and for such a variety of uses. Of course, in gas, gasoline or naphtha engines, the gas has only to be taken into the engine in the right quantity, but in this case the working agent being heavy oil, each charge must be first carefully prepared.

In the present case the function of the oil is to heat and expand the air, and as you will presently see, the method of controlling the power of the engine or governing its speed is by varying the

enough mixed, it is necessary that it should be moderately heated. To start the engine the mixer used in connection with the cylinder is warmed by the flame of a lamp, using oil dust and air in form of spray, to enable the first charge to be ignited, after which the heated products of combustion escaping from the cylinder are utilized to keep this chamber to its required temperature, without which heat the oil would drop away from the air, as it did in the bottle, as soon as it enters the cylinder.

Professor Unwin, in his paper, enumerates some of the many attempts to use hydrocarbon oils internally in engines, the invention of some of these processes dating back nearly 50 years, and he shows why the complex constitution of the oil gave rise to practical difficulties. In converting these oils into vapors, to be introduced into an engine, the high heating and the resolution of the oil into stable gas left certain tarry products behind that clogged the machinery. Priestman, by using the oil as oil dust in a warm condition, is able to burn that oil precisely as it would be burned in the wick of an oil lamp, and his aim is to burn all the oil, except that in contact with the cooler surfaces of the water-jacketed cylinder. Upon

combustion, and these act continuously afterward at a decreasing pressure during the full forward stroke, Fig. 4, and when at the end of that forward stroke the exhaust valve opens, allowing what remains cycle. There is a small pressure on the oil tank, sufficient to enable the air to be forced from the cold oil tank; the air from this reservoir, charged with oil dust, passing through the mixer, takes up, its

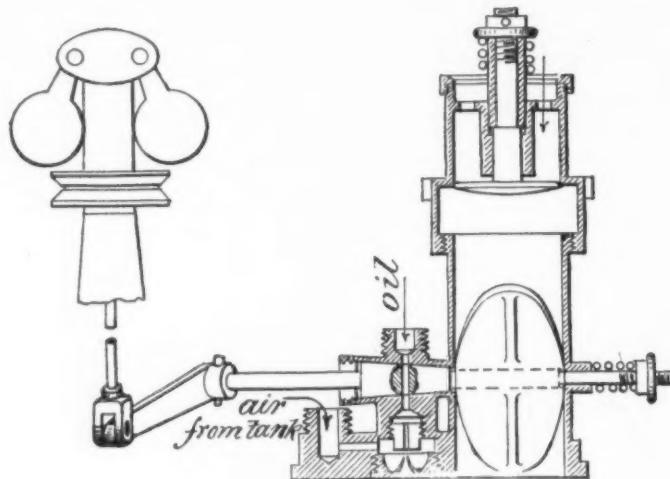


Fig. 5.—The Spraying Nozzle.

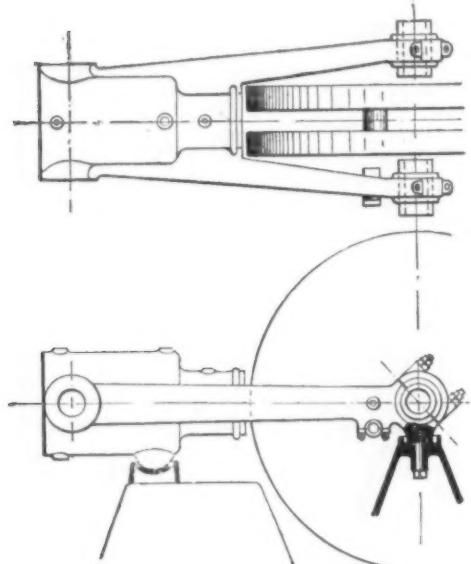


Fig. 6.—Frame and Cylinder.

these cooler surfaces the oil not burned is condensed and furnishes the means of lubrication without clogging the working parts by the formation of any tarry product. Some time ago I was cognizant of a remarkable demonstration of this fact. I had an opportunity to examine one of these engines after a five and a half weeks' run, and after 2,500,000 explosions had taken place in the cylinder. This engine, when taken apart, showed no perceptible injurious deposit on any part of the inside of the cylinder or in any part that was examined. There was nothing to indicate that oil had been used in it, except the clean, well-oiled condition of the cylinder itself. The ignition plug had not even once been removed during this run and the platinum points were as clean as when put in.

Detailed Description.

The Priestman engine is of the single acting, bi revolution type ordinary in heat engines. One explosion takes place in each two revolutions of the crank. A charge of air and oil dust, moderately heated, is discharged into the cylinder during the forward motion of the piston; on the return stroke this charge is compressed to less than half its bulk, and explodes while the crank is on its dead center. The result is an expansion of air and products of

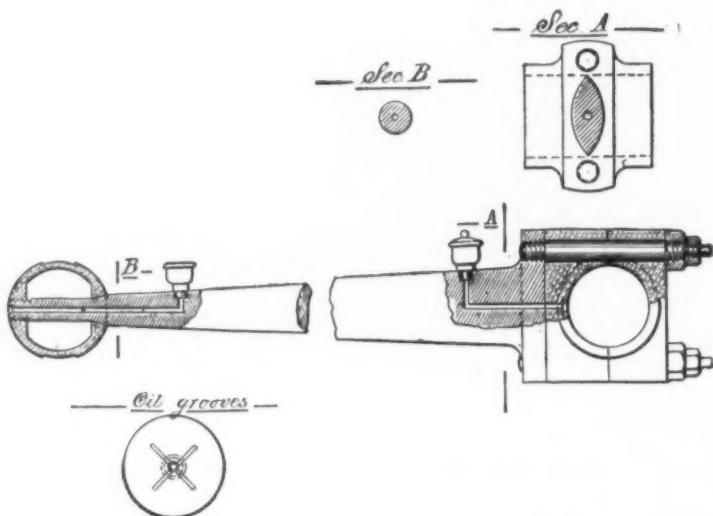


Fig. 7.—Connecting Rod.

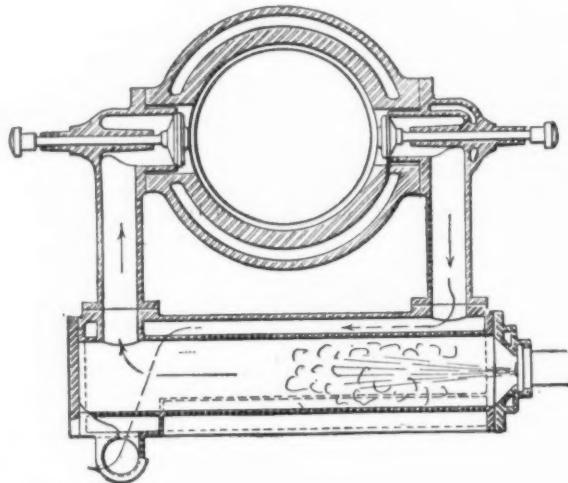


Fig. 8.—Inlet and Exhaust Valves.

THE PRIESTMAN ENGINE AS MADE IN AMERICA.

to escape, and the products of combustion due proportion of heat, as does also the that have not escaped are expelled or free air drawn in at the air valves, ex-swept out by the return stroke of the pands somewhat from the heat imparted piston, completing in this way one full to it, a charge enters the cylinder, is com-

pressed and ignited, expanding and thus giving the force required.

The spraying nozzle, as now used, Fig. 5, and to be explained to you, pulverizes or tears up the oil into very fine atoms, and at the same time protects the mouths of the passages from deposits of carbon which would choke and alter the character of the spray and affect the quantities of the oil and air.

The form of this nozzle was gradually changed. The earliest form, consisting

finally the air nozzle was turned back toward the oil nozzle, so that the current of air within the nozzle turned toward the escaping stream of oil. In other words, the air is actually blown in against the escaping oil, and the two thus brought into violent conflict are driven out into a spray of the required condition.

The regulation of the engine by governor to effect the variation of power called for by varying demands is effected by varying the oil supply, and not, as is the

case in one piece, the cylinder being water-jacketed, the arms hollow of box section. These arms carry the main bearing boxes. Near the back end of the cylinder are ports for the reception of the inlet and exhaust valve boxes. The cylinder and frame rests on three points, so that there can be no warping due to settling of foundations, and two bolts are used to secure the frame directly under the main bearings, while the cylinder end of the engine rests on the oil tank in a spherical seat, thus allowing free expansion and contraction.

The crank and fly wheel are precisely the same as in the straight line steam engine, and are peculiarly well adapted to this class of engine, as the shock due to explosion is almost entirely absorbed by the wheels, thus taking the wear off the main bearings. As a proof of the perfection of this action in an engine of 8 actual horse-power running daily for over a year there is not the slightest evidence of any wear having taken place. The grinding marks are still in the shafts and the scraping marks in the babbitt.

The connecting rod, Fig. 7, is a steel casting fitted with cast-steel boxes babbitted. It is attached to the piston by a ball joint.

The inlet and exhaust valves, Fig. 8, are placed opposite each other near the back end of the cylinder. These are cast-iron poppet valves with cast-iron seat and steel stems of sufficient length to withstand the wear and at the same time remain air-tight without packing or glands.

The exhaust valve is water-jacketed and operated positively by a cam, Fig. 9. The inlet valve is opened automatically by the suction of the piston.

The mixer, Fig. 8, is a cast-iron jacketed cylinder, around which the exhaust products are allowed to pass, keeping the inner chamber, into which the oil dust and air are ejected at a sufficient heat to prevent condensation of the oil dust.

The mixer is swung by connecting pipes from the inlet and exhaust valve boxes.

The air pump, Fig. 10, consists of a plunger turned to a proper working fit in the barrel without packing. The flap valves are rubber disks, which act noiselessly. The suction valve is provided with a strainer, made of two pieces of perforated brass, with a layer of cotton wool between them, to prevent any dust or grit passing into the oil tank.

A smaller pump arranged for operation by hand is provided to get up the necessary air pressure for the heater lamp in starting the engine.

The ignition device, Fig. 10, consists of either a primary or storage cell and induction coil. The primary wires are attached to a brass fork, the contact being made by a brass ball passing between the fingers at the proper moment. The secondary wires are connected to the ignition plug. This plug is made of brass; the wires in passing through it are insulated by two pieces of porcelain, and are provided with platinum points, between which the spark plays.

The paper then closes with statements from users of the engine, which show that in unskilled hands, in actual daily practice, it is entitled to the claims made for it by the author.

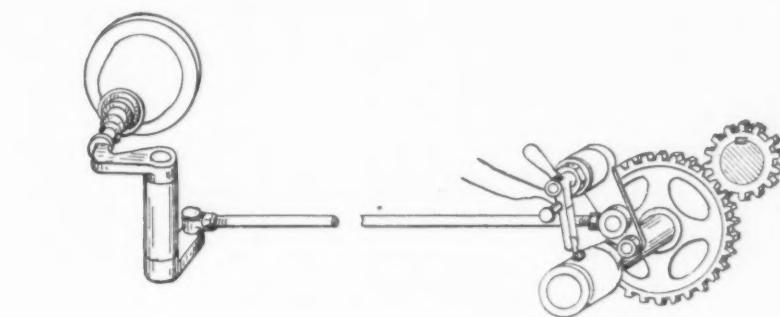


Fig. 9.—Showing Method of Operating Exhaust Valve.

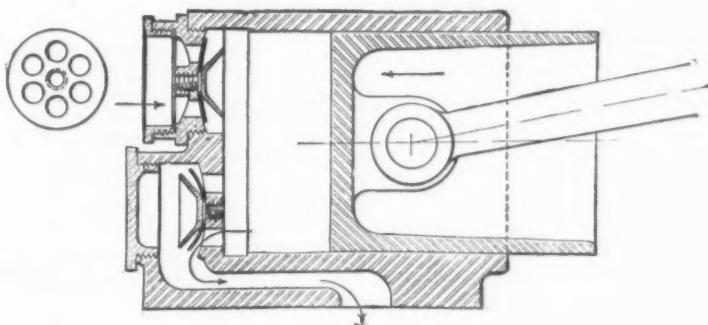


Fig. 10.—Air Pump.

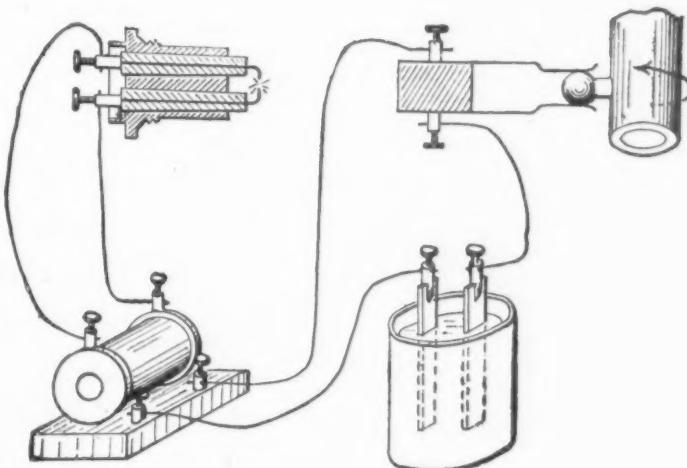


Fig. 11.—Ignition Device.

THE PRIESTMAN ENGINE AS MADE IN AMERICA.

simply of a concentric conoidal mouth piece, the near or oil mouth piece being ended in a fine point. After some time it was found better to make the oil nozzle blunt, so that the air was turned at a right angle at the moment of issue, and lastly the form of the air mouth piece is re-entrant, and the air turns through an angle greater than a right angle at the point of issue of the oil jet.

In the first of these, the oil is forced into and through an escaping column of air. Gradually the nozzles were shortened, and changes made to make the union a much more violent action until

case in most gas engines, by suppressing some of the explosions. The spindle which regulates the feed of the oil in the spray maker also regulates the supplementary air by means of a wing valve.

In general appearance the engine will at once be recognized as modeled on the straight line principle.

The foundation plate, Fig. 6, acts the part only so far as forming a support, but advantage is taken of the rear support by making it large enough to serve as a convenient oil tank, holding a supply for from fifteen to twenty hours full load.

The cylinder and frame, Fig. 6, are cast

in one piece, the cylinder being water-jacketed, the arms hollow of box section. These arms carry the main bearing boxes. Near the back end of the cylinder are ports for the reception of the inlet and exhaust valve boxes. The cylinder and frame rests on three points, so that there can be no warping due to settling of foundations, and two bolts are used to secure the frame directly under the main bearings, while the cylinder end of the engine rests on the oil tank in a spherical seat, thus allowing free expansion and contraction.

Shippers of freight are much interested in the absorption of the Old Colony Railroad by the New York, New Haven & Hartford people, as 1428 miles of road are thus put under one management; and as the Old Colony own five-sixths of the \$1,200,000 stock of the steamboat company Sound freights are liable to be affected. The Pennsylvania Railroad Company are pleased, because it is over the Old Colony that the latter obtain an entrance into Boston. One of the results will be a five-hour train between Boston and New York.

Mannesmann Locomotive Boiler Tubes.

According to the *Eisenbahn Zeitung*, the Austro German Mannesmann Tube Works have gone into the manufacture of locomotive boiler tubes by the Mannesmann process on a large scale, with satisfactory results. At the beginning of last year the Royal Railroad Commissioners at Berlin began a series of careful tests of the physical properties of tubes for locomotive work and, on the strength of the results obtained, have not only concluded to henceforth fit up all their new locomotives with these tubes, but have also given heavy orders for Mannesmann tubes to be used for renewals. As a rather interesting and noteworthy novelty recently introduced in the manufacture of the tubes, the *Eisenbahn Zeitung* cites the fact that, while the tubes are of uniform outside diameter, they are made with the inside diameters varying from end to end, giving a tapering interior, and a consequently greater thickness of the tube walls at one end than at the other. Advantage is to be taken of this feature by placing the tube ends with the greater weight of metal toward the fire-box end of the boiler, where there is apt to be most wear. At the smoke-box end, then, there would be less tube thickness, which, it is argued, would be conducive to a better utilization of the available heat of the cooler products of combustion.

—*Railroad Gazette.*

Production of Pig Iron and Coal in Germany in 1892 and 1891.

The pig iron production in Germany, including Luxemburg was, according to the statistics drawn up by Dr. Pentysch, the secretary of the German Iron and Steel Trade Association, as follows, in metric tons:

	1892.	1891.	Per cent.
Forge pig iron and spiegel	1,842,167	1,747,730	+ 5.5
Bessemer pig	313,819	384,196	+ 18.3
Thomas pig	2,006,400	1,704,279	+ 17.7
Foundry pig	630,670	616,414	+ 2
Total	4,793,008	4,452,019*	

showing an increase of 7.6 per cent. The small increase of forge pig finds its explanation in the circumstance that under this head there is also registered the Stahleisen, a kind of pig iron which is blown from spathic ores and used in large quantities for melting steel in the open-hearth furnaces. The decrease of Bessemer pig is more than counterbalanced by the enormous increase of Thomas pig, which is more than 300,000 tons, and which is mainly due to the blast furnaces of the Saar district and of Luxemburg Lorraine. This is shown by the following table, dealing with the productions of the various districts:

	1892.	1891.	Per cent.
Rheinland and Westphalia, without Saar	2,073,813	2,036,403	+ 1.8
Silesia	468,782	481,605	- 2.5
Saxony and Thuringia	24,230	21,595	+ 12.2
Saxony (Kingdom) and Hanover	155,825	158,021	- 1.4
Southern Germany and Luxemburg	975,335	804,970	+ 21.1
Saar district and Lorraine	1,095,018	949,425	+ 15.3

The development of Western Germany, to which country Sir Lowthian Bell prophesied a brilliant future in his famous book, "Principles of the Manufacture," is essentially due to the marvelous progress of the dephosphorizing process in Germany, as the calcareous ore for Thomas pig

* According to the German imperial statistics, which appear about one year later, the production in 1891 was 4,641,217 metric tons, and the difference may be explained by the fact that the figures of certain blast furnaces are not obtainable, but are estimated.

is as cheap in Luxemburg Lorraine as in any other place, while fuel may be had either from the Ruhr or from Belgium. While the blast furnaces in Westphalia were forced by the Westphalia coke syndicate to pay 13 marks per ton, the blast furnaces in Western Germany had to pay in the same time only about 10 marks, of course exclusive of freight, which is about 7 marks. As they use only 750 kg. of coke per 1000 kg. of pig iron, the advantage of the blast furnaces in Western Germany over their colleagues in Westphalia, who have to fetch their ores from Western Germany and have to pay three-fold freight, is evident. Hence their endeavors to canalize the Mosel River in order to get the ores from Luxemburg-Lorraine at cheap freights. It may fairly be added that besides the Thomas pig iron the production of a cheap phosphorous foundry pig is steadily growing in Western Germany and in fact the percentage of this district of the whole foundry pig made in Germany in 1892 was 40.1 per cent.

The coal production of the Ruhr basin in 1892 was 36,847,146 tons, as compared with 37,402,494 tons in 1891, showing a decrease of 555,348 tons. The average number of men was 142,195 (138,739 in 1891) and of course the work done by each man was less by about 3.3 per cent., as compared with 1891.

Effect of Time on the Qualities of Steel.

Very few can be found who have to deal with forging steel or with casting it who do not believe that by long standing its quality is more or less affected. In the seasoning of timber the changes produced are easily traceable to the extraction of water and the solidification of albumen in the wood cells; but in steel no chemical change occurs that analysis can detect, except upon the surface, which may be more or less oxidized.

Certain phenomena in the physical condition of steel will not be disputed by any one. Bars of steel standing upon the ground in a vertical or inclined position become magnetic after a time. Cracking of steel sometimes occurs while standing, no visible external cause being assignable, except, perhaps, a slight shock of some sort entirely inadequate in and of itself to produce such a result. Steel bars and plates that have remained sound under heavy strain are known to fracture subsequently under conditions of much smaller stress. How shall these undisputed facts be accounted for?

Only by the admission that molecular changes in steel may take place without external mechanical or chemical action can the peculiar deportment of steel under some circumstances be explained. It is a matter of common belief that edged tools after much use deteriorate in their cutting qualities, and that after being allowed to stand unused a sufficient length of time they recover this power. Generally when any belief of this kind exists among practical men it is not safe to deny its truth on merely theoretical grounds. For the most part, careful observation will discover a basis for the belief in facts, but the facts are sometimes not easily accounted for.

In the case of steel, however, there are many physical properties that indicate extreme molecular sensitiveness. The effect of sudden changes of temperature upon it in hardening and tempering, the refinement of quality obtained by judicious hammering at a proper heat, its susceptibility to magnetic changes, as in the magnetization of steel bars by the use of natural or artificial magnets, its demagnetization by subsequent heating, the per-

manent springing of steel castings and forgings when operated upon by machine tools that not unfrequently occurs upon removal of scale, all indicate that, notwithstanding the rigidity, hardness and tensile strength of steel, its molecular condition within certain limits is that of great mobility. That is to say, within molecular distances its molecules are capable of much greater activity than the molecules of very much softer and weaker metal—lead, for example.

Analogous changes are observed in other solid materials, of which glass may be cited. It is a well known fact that thermometer tubes when first blown and filled do not retain exactly their original form. Molecular changes take place in time that require to be allowed for, to secure accurate determination of temperature. Most thermometers thus in time tend to register 1° to 2° C. higher than the actual temperature. This is caused by a contraction of the glass. When glass is heated it never contracts to quite its original volume again on cooling. Glass also is found to expand unequally.

This sensitiveness of molecules under changes of temperature is so pronounced in steel that heating and subsequent cooling almost invariably produce a greater or less change of form in anything made of steel. In tempering tools this difficulty often becomes very perplexing where accurate form is essential. Of course, to produce changes of form that can be measured temperature changes of considerable magnitude are necessary; but the effect of lesser changes must be the same except in degree. We must, therefore, look upon steel as a metal in which the molecules are in a highly active state and capable of assuming different physical relations to each other, such changes being more or less permanent, according as they affect the homogeneity of the mass. In the case of the cracking of bar or plate steel, the activity of the molecules has pulled apart some of them beyond the limit of their normal cohesive attraction. Such cracking frequently occurs in glass. The writer once witnessed the spontaneous shivering into pieces of a wine-glass standing entirely untouched upon a table where a party was seated at dinner. This final shattering was undoubtedly the effect of molecular strains gradually accumulating in the material.

It would seem that some systematic investigation of spontaneous changes liable to occur in steel in the lapse of time, with out apparent external causes, might be profitable. At least it is desirable that the belief in such changes, now based principally upon shop lore, may be brought to the test of scientific methods, and its truth or falsity thoroughly demonstrated.

The firm of Henry R. Worthington of 36 Liberty street, New York, have issued in book form some of the most important tests of the high-duty Worthington pumping engines. The first test reported was made on a 3,000,000-gallon pump specially arranged for testing, at the Brooklyn works of the builders. This engine was arranged so that "it pumped out of a well and through weighted relief valves back to the well, so that trials could be made which would have been impossible had the engine been performing the ordinary duty at a water works. To pump about 1700 gallons a minute through weighted and spring valves is a more difficult service than pumping against a head of water in a main. It was, therefore, evident that whatever results were obtained on the trials they could be readily repeated and improved upon in practice. The third day's test showed a duty of 114,000,000 foot-pounds. Tests are also presented of the 5,000,000 gallon high-duty pumping engine at New Bed-

ford, Mass.; the 10,000,000-gallon pump at Montreal; and other pumps at Davenport, Iowa; Hampton, England; London, England; Minneapolis; Chicago; Hammersmith, England; Memphis, Birmingham, Ala.; Syracuse; Nashville, Tenn.; Lowell, Mass.; Norfolk, Va., and Port Perry, Pa. One of the most interesting tests is that given by Prof. J. E. Denton on the performance of a Worthington high duty pumping engine of 1,500,000 gallons capacity against a head equivalent to 2000 feet of water. This is the paper presented at the Providence (1891) meeting of the American Society of Mechanical Engineers. This pump is used for pumping crude petroleum over one of the eleven 30 mile sections of the Standard Oil Pipe Line connecting New York City with Olean, Pa., and is situated about four miles from Port Jervis, N. Y. The test showed a duty of 16,500,000 foot-pounds per 100 pounds of coal.

This collection of tests, taken as they were under widely varying conditions,

of the works, otherwise necessary, about \$235,000. In addition an ever increasing extravagant waste, restrained only by lack of capacity of the works, has been stopped and the *per capita* consumption has for four years been going steadily downward, instead of upward. Until the consumption is reduced to at least 100 gallons *per capita* the water commissioners of Detroit, it would seem, cannot begin to rest contented with the results of their efforts to save water, for, as shown in our issue of January 16, 1892, of 39 of the 50 largest cities of the United States, excluding Detroit, the daily water consumption of 31 was below 140, and of 21 below 100 gallons *per capita*, while 14 of these cities had a consumption of only 75 gallons or less, and 5 were below 50 gallons.

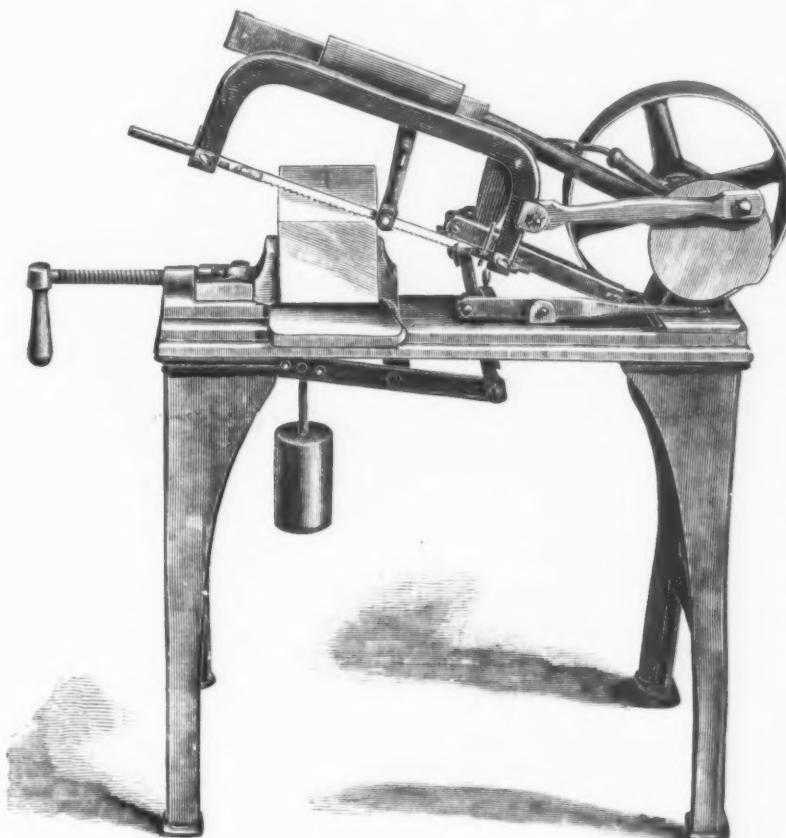
The Leader Sawing Machine.

The Leader sawing machine, recently put on the market by the Frasse Company of 90 Park Row, New York, is in-

the floor. The saw clamps, adjustable for a blade up to 14 inches in length, are so arranged that the straight running of the blade is insured. The machine is provided with a gauge for regulating the length of the pieces to be cut and also with an extra saw guide, which may be attached to the frame guide by a thumb screw. This is of benefit when very thin sections are to be cut off, but is not necessary for ordinary work, as the blade runs well enough without it. The shaft bearing is bushed; consequently the resultant wear comes on the bushing and not on the bearing, and as it is bored and turned to a standard size, in case of wear it may be replaced easily.

The Small Arms of the Great Powers.

The newest small arms of the Great Powers are of the following calibers: Austrian Mannlicher, 0.315 inch; French Lebel, 0.315 inch; German Mannlicher, 0.311 inch; British Lee-Metford, 0.303 inch; Russian Mouzin, 0.300 inch, and Italian Carcano, 0.256 inch. The weights of the rifles, without bayonets, are: Austrian, 9.6 pounds; French, 9.2 pounds; German, 8.3 pounds; British, 9.2 pounds; Russian, 9.5 pounds, and Italian, 8.2 pounds. Several of the powers now supply to each man 150 cartridges. Assuming this to be the number all round, the weight is: Austrian, 9.8 pounds; French, 8.1 pounds; German, 8.9 pounds; British (black powder), 9.2 pounds; Russian, 7.7 pounds, and Italian, 7.1 pounds. Thus the caliber of the rifle, as a rule, regulates to an important extent the total weights to be carried by the men in action. Putting aside bayonets, cartridge boxes, magazines and other equipment, the Austrian soldier, whose rifle is of the largest caliber, carries in rifle and 150 cartridges a weight of 19.4 pounds, while the Italian soldier, whose rifle is of the smallest caliber, carries in rifle and 150 cartridges a weight of only 15.3 pounds. The British rifle and ammunition are, however, too heavy in proportion to the caliber, and the result is that, although the British soldier uses a bullet of less caliber than the Austrian, the French or the German soldier, he carries a greater proportionate weight in rifle and ammunition than any soldier except the Austrian. It may be added that Belgium has adopted a caliber of 0.301 inch. Roumania, one of 0.258 inch; Spain, one of 0.295 inch; Turkey, one of 0.301 inch, and Switzerland, one of 0.295 inch. Belgium, Spain and Turkey use the Mauser principle; Roumania uses the Mannlicher and Switzerland uses the Schmidt.



THE LEADER SAWING MACHINE.

proves most conclusively the excellence of both design and workmanship of the Worthington high-duty pumping engines.

According to the *Engineering News*, the use of meters at Detroit, Mich., has shown some remarkable results. It has effected a reduction of the daily *per capita* consumption of water from 204 gallons in 1888 to 140 gallons in 1892, about 31 per cent., and has so reduced the pumping expenses as to make the operating expenses for 1892 actually \$2251 less than for 1888, notwithstanding an increase in population estimated at 46,000 and an increase in families supplied from 36,863 in 1888 to 46,400. While the population increased over 40 per cent. from 1888 to 1892, the total yearly consumption decreased nearly 15 per cent. L. N. Case, secretary of the Detroit Water Board, estimates that in the past four years the meters introduced have saved, in pumping expenses and interest on enlargements

tended for cutting iron or brass bar or tubing of any shape or size up to 5 inches in diameter. The machine is provided with an automatic tension which permits of adjustment for metals of various densities, this being accomplished by setting the weight forward or backward on the lever to suit the class of work operated upon.

The adjustment of the weight also controls the blade for rapidity of cut, as when the frame has advanced and made a cut it is lifted slightly, freeing the blade during the return stroke, thus preventing the teeth from dragging; upon completion of the back stroke the frame descends and is ready to make a new cut. It will be readily seen that the life of the blade is lengthened by this construction. A pivoted vise similar in design to a planer chuck is employed to hold the work, thus enabling the user to cut off pieces at any angle. A table-like projection is added to the bed below the vise to prevent a partly detached piece from dropping to

The Railway Age for last week tells the following story: "When a locomotive freezes to the track while taking water so that its steam will not move it, and remains fast for four hours until another engine can be got to bump it loose, the weather may be said to be extraordinarily cold. Yet this is what happened to the engine of a fast Illinois Central train at a lonely water tank in Illinois one morning last week. Next time the boys will see that they do not let the tank overflow so as to form a pool around the tender trucks when the mercury is a rail length or so below zero. But it is strange that with railways running well up toward the arctic regions in this country it should be left to a road in central Illinois to be the scene of such an unusual occurrence."

The Wallis Lispenard cotton picker is about to be put on the market. It is of very simple construction, light running, easy to operate, and the motive power is furnished by the two mules that propel the machine over the cotton fields. It has the capacity to do the work of from 40 to 50 field hands each day.

The Development and Transmission of Power from Central Stations.

Prof. W. C. Unwin recently delivered a lecture before the Society of Arts, London, on the transmission of power from central stations. The author stated that before treating of methods of transmission it was necessary to consider the generation of the energy at the central station, and the conditions under which this station usually worked, and to ascertain to what extent power thus generated would be able to compete with isolated plants. The reasons why this could, in certain cases, be economically done were briefly as follows:

1. In the case of steam power there was economy in the first cost of machinery and in the cost of fuel and superintendence in generating the power in large quantities at one place instead of by numerous smaller and scattered engines.

2. In the case of water power, in many instances the power could only be utilized by a number of consumers combining together to construct the necessary permanent works.

3. The locality for generating power might be fixed by one set of conditions and the point where it could be best used by another set. In many cases it was, therefore, a question between using a cheaper source of power at a distance, instead of a dearer source near at hand.

4. In the case of steam power, though coal could be carried nearly everywhere, and at a comparatively cheap rate, nearness to a point where coal could be easily delivered, or where condensing water could be easily obtained, might make it desirable to erect a steam station at a distance from the point where the power was to be used. It had thus been proposed to generate power at coal fields, and to convey the power electrically to manufacturing towns, but the question was purely a financial one—viz., whether the cost of transportation would counterbalance the saving in the cost of fuel.

5. Population at present was gathered into industrial centers, with a constantly increasing need for mechanical power, which had been at first met by the erection of scattered motors, a very uneconomical plan. The first cost of the motor was high and the efficiency of small motors was low. Moreover, they often worked intermittently, still further reducing their efficiency. By generating energy in an easily transportable form, huge waste could be prevented, and just as in great towns private means of water supply had been superseded by a public supply, so it would probably be found advisable to provide a system of power distribution in most important towns.

For the single purpose of working lifting machinery, it had proved economical and remunerative to lay down many miles of high-pressure water mains through the London streets. In July, 1884, the London Hydraulic Power Company supplied 96 consumers. In 1888 this number had increased to 720, and in 1892 to 1676. The quantity supplied was 317,000 gallons in 1884 and 6,000,000 gallons in 1892. Perhaps a more striking instance of a similar kind might be found in the small town of Geneva. This town had a population of 50,000 only, yet the largest development of power at a central station and its sale as a merchantable commodity was to be found there. In 1871 Colonel Turretini applied to the municipality for leave to connect a small pressure engine to the then existing low-pressure mains for driving the factory of the Genevan Society for the Manufacture of Scientific Instruments. In case of this plan proving a success, he asked leave to install similar motors in other parts of the town. The plan proved so convenient that in 1880 110 water mo-

tors were supplied from these mains, using nearly 30,000,000 gallons of water, and paying \$10,000 a year to the municipality. The cost per horse-power was not low—viz., about \$175 to \$225 per year of 3000 working hours. But this high price did not prevent its use, so convenient was it in other respects. Since then a high-pressure service had been established, the water being pumped by turbines in the

As regarded the sources of mechanical power, wind power was intermittent, and could therefore only be used conveniently for work which was also intermittent. An enormous amount of power might be provided by the tides were not the works required to utilize it so expensive. The direct action of the sun's heat might also be used, but here again the cost of utilization was prohibitive. Practically and com-

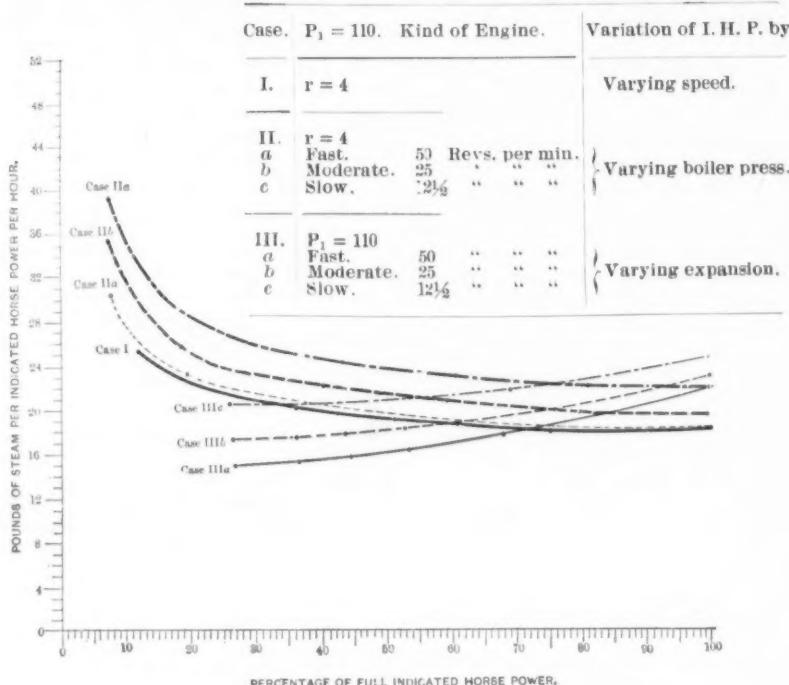


Fig. 1.—Condensing Engine.

Case.	Kind of engine.	Variation of I. H. P. by	Case.	Simple engines.	Variation of I. H. P. by
I	$r = 4 P_1 = 100$.	Varying speed.	III	" Michigan," " Mair," " Gallatin," " Gateley."	Varying r.
II	$r = 4$ Revs. per min.		"	" "	" "
a	Fast.	50 }	III.	Compound engines.	
b	Moderate.	25 }	"	" Bache,"	Varying r.
c	Slow.	12½ }	"	Donkin (non-jacketed),	" "
III	Fast.	50 }	"	Donkin (jacketed),	" "
a	Moderate.	25 }	IV.	" Leila."	Varying r. & n.
b	Slow.	12½ }			

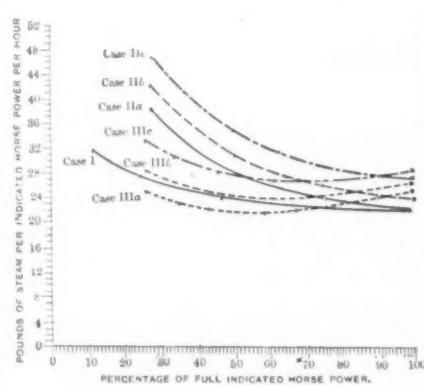


Fig. 2.—Non-Condensing Engine.

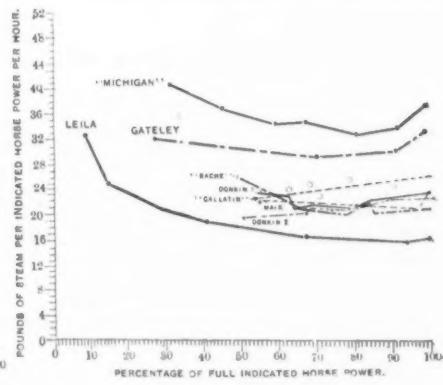


Fig. 3.—Condensing Engine.

DEVELOPMENT AND TRANSMISSION OF POWER.

Rhone, and the cost to the consumers had been reduced to about \$40 per horse-power per annum. The Geneva installation was really a very large one, and was being steadily augmented, so that in 1895 4200 horse-power would be available, and a second pumping station was then to be installed about 6 km. from the town, to which power would be conveyed electrically.

Commercially the only sources of power which could permanently be relied on were: 1. The muscular energy of animals. 2. The action of gravity on water falling from a height to which it had been raised by the sun's heat. 3. The conversion of heat into work, the heat being derived by the combustion of fuel. Solid fuel was by far the most important source of energy, but as it had to be burnt in an open furnace one-

fifth of its total heat escaped with the products of combustion. Next, in transforming the heat into work by a steam engine at most three-eighths of the heat in the steam, or three-tenths of the total heat of combustion of the fuel, could in any case be utilized, the remainder being necessarily rejected in the condensers. This fraction was still further reduced by all imperfections and losses in the engine itself. Finally, the attendance required by an open furnace and the difficulty of preventing smoke were further disadvantages.

Many of these disadvantages could be avoided by the use of gaseous or liquid fuel used in internal combustion engines. The transport of gas was very convenient, and the engines themselves required little attention, and worked with a much greater temperature range than steam engines. Their thermal efficiency in practice was double that of steam engines of large size. On the other hand, ordinary lighting gas was much more expensive for a given calo-

ry every-day work, but such facts as were known showed it was more than on trial. Thus a large London pumping engine, working with a fairly constant load night and day for a period of many weeks, during which it had been run for 90 per cent. of the whole time, used 2.7 pounds of coal per effective horse-power, while on special trial the engines had worked with 2.7 pounds per effective horse-power hour. Mr. Ellington's large pumping engines worked under more unfavorable conditions. They had a fairly steady day load, but a small night one. On trial they used 2.13 pounds per indicated horse-power hour, but on ordinary working this was increased by one-third to 2.93 pounds. Lastly, in electric lighting stations the engines worked under a very fluctuating load, and the results were far more unfavorable. The Kensington Court station had an excellent Willans non-condensing engine, which on full load trials worked with under 2 pounds per effective horse-power hour, but in the ordinary daily working of the station these engines used 7½ pounds per effective horse-power hour in 1886, which was reduced to 4.3 pounds in 1890 and 3.8 pounds in 1891. Probably in very few cases were the engines at electric light stations working under a consumption of 4½ pounds per effective horse power hour. In the case of small isolated motors working with a fluctuating load, still more extravagant results were obtained. At Birmingham a number of experiments on small engines gave the following results:

With the range of temperature available the steam engine might, on thermo-dynamic principles, turn into work three-eighths, and the gas engine half, of the heat energy supplied. No actual engines reached these figures, even approximately,

Case.	Kind of engine.	Variation of I. H. P. by
II.	Condensing triple. Non-condensing triple. compound.	Varying boiler pressure.
III.	"	Varying expansion.
V.	" simple.	Varying p. & r.

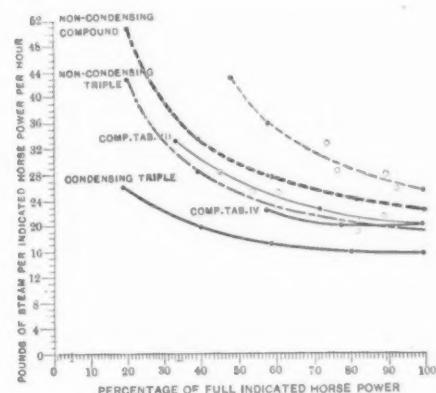


Fig. 4.—Willans Engine.

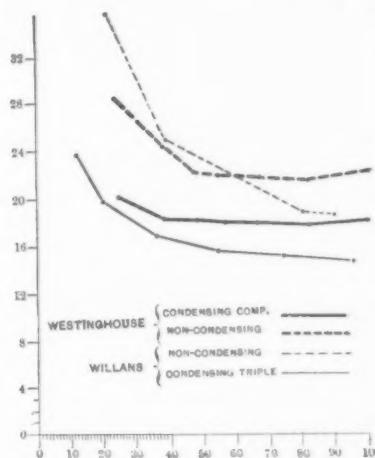


Fig. 5.—Westinghouse and Willans.

DEVELOPMENT AND TRANSMISSION OF POWER,

trific value than coal, its cost being greatly increased by the excessively large plant required to meet the enormous fluctuations in the demand, and also the large charges involved in distributing to a number of small consumers. If gas were made specially for power purposes, it could probably be sold at half the present London price, at which price gas engines could compete on nearly equal terms with steam. M. Aimé Witz had shown by direct experiment that a gas engine worked with Dowson gas would give an effective horse power at a total cost not greater than that at which an effective horse-power is produced from coal by a good compound steam engine. Gas engines were, however, more restrained in size than steam engines, and they worked very economically at light loads.

Professor Forbes has pointed out that a considerable quantity of power could be obtained from ash bin refuse. The most effectual and economical method of disposing of such refuse was to burn it. To do this properly a high temperature and a large supply of air were required. A large quantity of products of combustion passed away at a high temperature and

the principal cause of waste in both cases being the action of the cylinder walls, which abstracted heat from the working fluid before the end of the stroke. This loss increased with the ratio of admission surface to the weight of the working agent, and hence in the same engine it increased with light loads. In the case of steam this loss could be partially diminished by jacketing, but it always tended to make engines lightly loaded or too large for their work uneconomical. In gas engines the action of the walls affected the efficiency at light loads still more unfavorably. The value of compression in gas engines was that it reduced the ratio of the surface at ignition to the weight of the gas used.

Omitting from consideration small engines, the general result of numerous trials was that with a constant load an indicated horse power should be obtained with a consumption of 1½ pounds of coal per indicated horse-power for a condensing engine, and 1¾ pounds for a non-condensing engine, figures which correspond to about 1½ pounds to 2½ pounds of coal per effective power. It was much more difficult to ascertain the consumption of coal in or-

Nominal horse-power.	Probable indicated horse-power at full load.	Actual average indicated horse-power during observation.	*Coal consumption per indicated horse-power hour during observed values.
4	12	2.06	36.
15	45	7.37	21.25
20	60	8.2	22.61 *
25	75	8.6	18.13 *
20	60	23.04	11.68
20	60	19.06	9.53
20	60	20.08	8.50

It was largely to replace such engines as the above that power would be distributed from central stations.

At electric lighting stations the load factor, viz., the ratio of the average load to the maximum, was extremely small, and the engines worked under very unfavorable conditions, which largely accounted for the excessive fuel consumption at these stations, which was so great that some engineers were inclined to discredit the figures obtained. Mr. Crompton was the first to draw attention to the load curve of such stations as affording a partial explanation of their anomalous results.

In steam engines the fuel consumption had generally been reckoned on the indicated horse-power. At full-power trials this was satisfactory enough, as the internal friction was then usually a small fraction of the total. Experiment had, however, shown that the internal friction was nearly constant, and hence, when the engine was lightly loaded, its mechanical efficiency was greatly reduced. At full load small engines had a mechanical efficiency of 0.8 to 0.85, and large engines might reach at least 0.9, but if the internal friction remained constant this efficiency would be much reduced at low powers. Thus, if an engine working at 100 indicated horse-power had an efficiency of 0.85, then when the indicated horse-power fell to 50 the effective horse-power would be 35 horse-power and the efficiency only 0.7. Similarly, at 25 horse-power the effective horse-power would be 10 and the efficiency 0.4.

Experiments on a Corliss engine at Creusot gave the following results:

Effective power.	Mechanical efficiency.	
Effective power at full load.	Condensing.	Non-condensing.
1.0	0.82	0.86
0.75	0.79	0.83
0.50	0.74	0.78
0.25	0.63	0.67
0.125	0.48	0.52

Another cause tending to reduce the efficiency at low loads was the work done against back pressure, which was more important in the case of non-condensing than in that of condensing engines. At full loads the additional work done by the non-condensing engine against back pressure was partly balanced by the greater cylinder condensation due to the greater temperature range in the condensing engine, and hence at full loads the fuel consumption of the former was not much the greater of the two; but with light loads the condensing engine was the more economical, as shown by Fig. 1. If, however, the power of the engine was altered by varying the speed instead of the effective mean pressure, the work done against back pressure would be a constant fraction of the total at all powers.

At light loads the economy of gas and liquid fuel engines fell off even more rapidly than in steam engines. The engine friction was large and nearly constant, and in some cases the combustion was also less perfect at light loads. At the Dresden central station the gas engines were kept working at nearly their full power by the use of storage batteries. The results of some experiments are given below:

Brake load, Per cent. of full power.	Gas engine, Cubic feet of gas per brake horse-power.	Petroleum engine, Pounds of oil per brake horse-power.	Petroleum engine, Pounds of oil per brake horse-power.
100	22.2	0.96	0.88
75	23.8	1.11	0.99
59	28.0	1.44	1.20
20	40.8	2.38	1.82
12½	66.3	4.25	3.07

A third cause affecting the consumption of steam under varying loads was the initial condensation. In some experiments on a special type of engine regulated by throttling, Mr. Willans had shown that the consumption of steam could be written in the form $v = a + b \text{ H.-P.}$, where a was a constant, depending on the size as well as on the type of engine. Professor Cotterill had shown how to calculate the cylinder condensation for an unjacketed simple engine, and the rest of the steam used could be calculated in known ways. The curves shown in Figs. 2 and 3 had thus been calculated for a great variety of conditions. Taking the case of a condensing engine, Fig. 1, the curves had been calculated for a fast running, a moderate speed engine and a slow one, the power being varied by throttling, by varying the speed and by varying the expansion. The curves for a non-condensing engine, Fig. 2, had been drawn for a similar variety of conditions, and it would be seen that the steam consumption for light loads increased more rapidly in this case. In diagram 8 all the trustworthy experimental results on this point that he could find had been plotted. With the exception of the Leila, the power was varied in every case by altering the expansion, but in that case both speed and ratio of expansion had been altered. It would be seen that the general run of the curves was the same for this diagram and for the calculated one, Fig. 1. In Fig. 4 a number of Mr. Willans' results on a non-condensing engine had been plotted, and

here again the general character of the curves was the same as in the calculated diagram.

Taking all causes of loss of efficiency into account, they did not completely explain the enormously large fuel consumption at central stations. Another most important cause of loss was the waste in heating up and cooling down boilers. This waste was unavoidable, unless the load line could be improved. At Cologne it was attempted to do this by using the engines for pumping during the day and for lighting during the night. This fluctuation of load line had led to attempts at storage. In gas works the gasholder was usually designed to hold 24 hours' supply, and the cost of large holders, as erected, did not exceed 5 shillings 6 pence per horse-power hour stored, taking 25 cubic feet of gas to the horse power, and for very large holders it was even less. The cost reckoned on the rate of supply was thus about £6 per horse power. Allowing 8 per cent. for interest and depreciation, this made the charge per horse power delivered continuously throughout the year about 10 shillings.

It was at first thought that in the secondary battery the electrical engineer had found an equivalent to the gasholder. The rate of discharge of such batteries was, however, limited, and they, moreover, gave back only about four-fifths of the energy put into them. Nevertheless, the battery would probably have given a balance of advantage to continuous low-tension current systems, in districts not too large and not too widespread, had it not been for its excessive cost. The conditions of electric lighting required ability to supply energy at four times the mean rate, and about half the total supply had to be furnished during periods in which the demand exceeded the mean supply. For these conditions the secondary battery should be capable of storing half the total energy generated, and must be able to discharge at four times the mean rate. This latter condition usually determined the size required. The cost absolutely prohibited this, and, at most, the batteries supplied were capable of storing one-fifth the daily supply. Used in this way, they seemed to be useful and to diminish working expenses. At Kensington their use allowed the station to be shut up for 13 hours daily, but they did not prevent the waste due to starting and stopping of the boilers and engines, but did improve the conditions of working for the latter. This shutting down of the station for half its time was not, however, consistent with economical working, and the worst evils of the varying demand remained. From data kindly supplied by Professor Ayrton, it appeared that eight Epstein cells of the latest construction would work at the rate of 1 horse-power, and would store a charge enabling them to work at that rate for two and a half hours. These cells, exclusive of erection, buildings and insulation, cost £20, or £8 for 1 horse-power hour stored. At Frankfort, Herr Askar von Muller and Mr. Lindley had provided large secondary battery stations with a capacity of 11,700 ampere hours, the current being supplied at 100 volts. Their maximum rate of discharge was 3500 ampères, and the cost as erected, including £11,600 for buildings, was £36,700, or £23 per horse-power hour stored, or £78 per horse-power of discharging capacity. The annual cost, at 20 per cent. for depreciation and interest, might therefore be put at £15.6 per horse-power of discharging capacity.

Druitt Halpin had suggested thermal storage, which in his (Professor Unwin's) opinion met the difficulty, both mechanically and financially. At steam stations the energy was first produced in the form of heat which might be stored directly.

In New York steam was transmitted without much loss from radiation and conduction through many miles of pipe, and with proper precautions there was no doubt the loss could be made very small. In half a dozen American towns water heated to 400° F., or 250 pounds per square inch, was circulated through mains and delivered to houses. On Druitt Halpin's scheme the heat would be stored by raising water to a high temperature. By reducing the pressure this heated water would give off steam at any rate of discharge required. He proposed to store this water in reservoirs, at a temperature, when they were fully charged, of 406° F., corresponding to a steam pressure of 165 pounds absolute. The engines would work at 130 pounds absolute, or 347° F. Hence the range of temperature available would be 59°. Allowing for the change in the specific heat of water at these temperatures, each pound of water, while its temperature fell through this 59°, would give off 61 thermal units. The total heat of steam at 130 pounds pressure absolute was 868.8 heat units. Therefore, 14.4 pounds of water would, under the above conditions, suffice to generate 1 pound of steam at this pressure, or, say, 16 pounds, to allow for losses. Hence a cylindrical reservoir 8 feet in diameter and 30 feet long would hold 84,000 pounds of heated water, equivalent to 5250 pounds of steam at 130 pounds absolute pressure. The steam required might be estimated at 18 pounds and 25 pounds for condensing and non-condensing engines respectively, when these were not run too lightly loaded, corresponding to 24½ pounds and 34 pounds per kilowatt hour. Hence such a boiler would supply 286 effective horse-power hours, or 216 kilowatt hours, with a condensing engine, and 210 horse power hours, or 154 kilowatt hours, with a non-condensing engine. As regards the cost, reliable estimates showed that such a reservoir could be installed complete with the necessary buildings for £470, a figure which corresponded to £1.64 per horse-power hour stored for the condensing engine, and £2.24 for the non-condensing one. As the gasholder cost 5 shillings 6 pence per horse-power hour stored, and the storage battery £23, it appeared that the proposed system, though dearer than the gasholder, was very much cheaper than secondary battery storage.

Frank A. Hollenbeck, who has been the superintendent of the Baker Gun Works, at Batavia, N. Y., since their establishment, has resigned his position and will go to Syracuse, N. Y., to superintend the manufacture of a new gun of his own invention. A stock company has been formed in that city for its manufacture, and a factory is now being fitted up for the purpose. The gun is not in any way a rival of the Baker gun, or in fact of any other gun of American manufacture. It is a hammerless ejector, fowling piece of high grade and high price, retailing from \$200 up, and sportsmen who have heretofore used the style and grade have had to buy the imported article, upon which this is said to be an improvement.

The Advancement Association of North Milwaukee has been organized, with a capital stock of \$100,000, which will be used in improving the new town and for the purpose of inducing manufacturing enterprises to locate at that point. Negotiations are now pending with four large manufacturing concerns to locate at the new town. One of them is an extensive iron works from a Western city, which will employ 300 or 350 hands. Another is an electric plant which will furnish power for the new bridge works as well as light for the entire town.

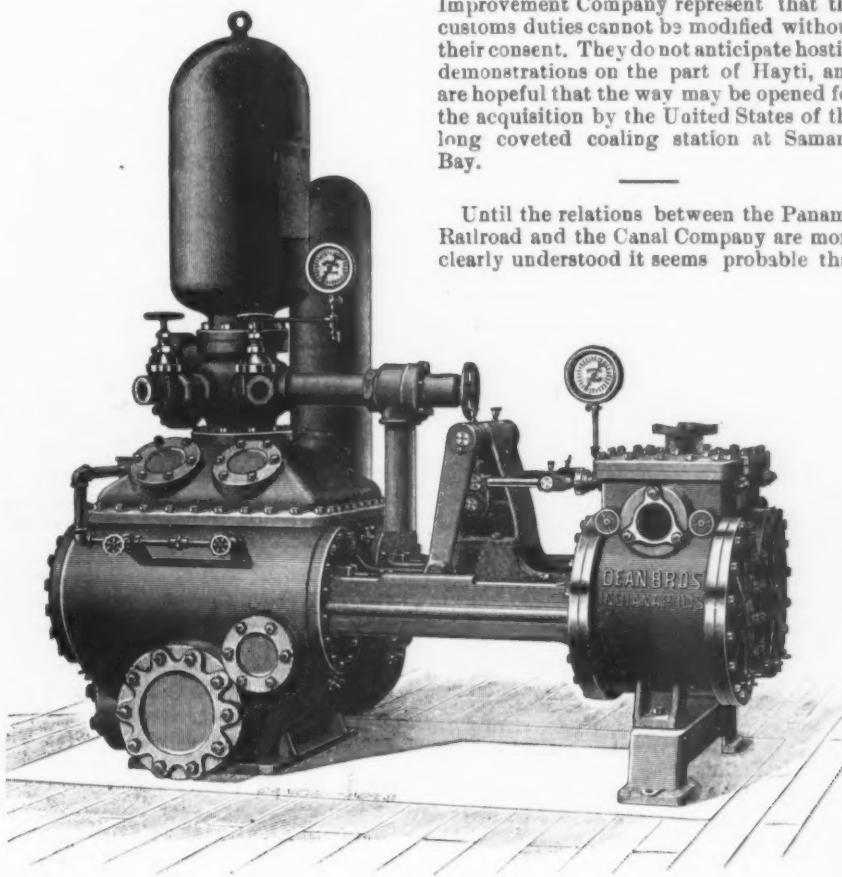
The Dean Underwriters' Pump.

The Dean Brothers' Steam Pump Works of Indianapolis, Ind., have just brought out a duplex fire pump to conform to the demands of the Associated Insurance Companies for a special fire pump for use in mills, factories and public buildings, where the premium on insurance risk is based upon the completeness of fire protection furnished by the insured.

These pumps are made in strict accordance with the specifications adopted and required by committee on improved risks, representing the Associated Fire Insurance Companies, and the John R. Freeman specifications as required by the Associated Mutual Insurance Companies, and are constructed, inspected and tested according to the true intention and meaning of these specifications.

They are made of first class material, and finished and tested to a maximum pressure of 320 pounds to the square inch at the water end before leaving the works.

They have bronze water piston heads and followers, bronze removable liners in the water cylinders, Tobin bronze piston rods and valve rods, bronze or bronze-lined stuffing boxes, cushioning valves in steam cylinders, a capacity plate, a stroke gauge, a steam-pressure gauge, a water-pressure gauge, a vacuum chamber, a water relief valve of large capacity, a set of brass priming pipes and valves, from two



THE DEAN UNDERWRITERS' PUMP.

to four Chapman hose valves, and a sight feed lubricator. The water cylinders have three suction openings.

They have large water valve area, large steam and exhaust passages, suction pipe connections and air chamber.

They are designed for stationary fire engines and can be operated at a high rate of piston speed without danger of breaking.

any traffic arrangements on the Isthmus are liable to be modified, especially should Congress push its investigations under the resolutions offered a few days ago, but for aught that now appears to the contrary the contract entered into between the Panama Railroad Company and the North American Navigation Company, chartered in California for through traffic between New York and San Francisco, will at least

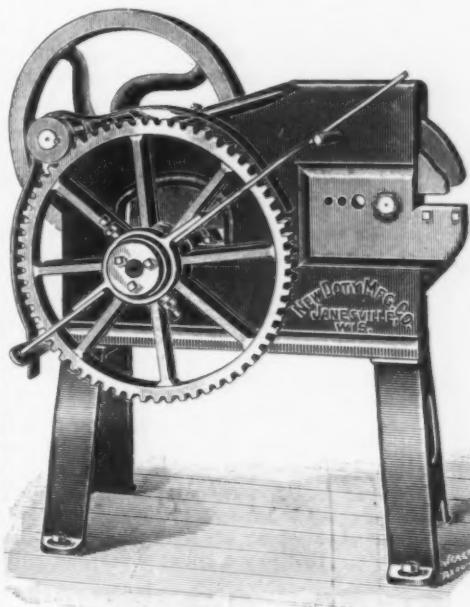
Below we give a partial list of sizes and capacities of these pumps:

Number of standard $\frac{1}{2}$ fire streams each (250 gallons per minute).	Ratio of areas steam to water piston.	Nominal capacity, Gallons per minute, full speed.	Diameter steam cylinder, Inches.	Diameter water cylinder, Inches.	Length of stroke, Inches.	Exact capacity underwriters' rating, Gallons per stroke.
One stream	1 to 1	320	12	6	10	321
Two streams ..	4 to 1	500	16	8	10	569
Three streams ..	8 to 1	750	16	9 $\frac{1}{4}$	10	767
Four streams ..	3 to 1	1000	18	10	12	1007

temporarily hold good. General Newton stated that the first ship from San Francisco will sail on the 20th inst.

The New Doty Shear.

The accompanying engraving represents a new shear brought out by the New Doty Mfg Company of Janesville, Wis. It is especially adapted for cutting bar iron, either flat or round, the machine shown—the smallest size built—cutting 3 $\times \frac{1}{2}$ inch flat bar, or 1-inch round. The knives for flat and round iron are independent of



The New Doty Shear.

each other, and both sets of knives are at all times ready for use without any change. The round iron knives are made the reverse of the iron, and do not flatten it in cutting. The machines are made very strong and powerful, and do their work easily. All boxes are cast solidly on to the body of the machine, and there are as few separate parts as possible. The eccentric, eccentric shaft and clutch are all cast in one piece. The balance wheel, shaft and all bolts are of steel. The motion of the knives is controlled by a clutch, which can be operated by hand or foot power.

The boiler makers' strike in the Brooks Locomotive Works, at Dunkirk, N. Y., has been declared off and the strikers are applying for their positions. As far as places can be made for them they will be taken back.

The new Morgan line steamer, "El Rio," built at the yards of the Newport News Shipbuilding Company, is the largest all-steel merchant steamer now under the American flag. She is 406 feet long, with 48 feet breadth of beam, and has a gross tonnage of 4500 tons. Her coal consumption does not exceed 60 tons a day, and it is calculated that she can coal in New York for the round trip to New Orleans and have 200 tons on hand at the completion of her trip.

The British Admiralty has definitely adopted a wire quick-fire 6 inch gun, weighing seven tons, and which sends an elongated shot of 100 pounds weight for a distance of four miles so rapidly that there are four shots in the air at once. Forty of these guns are about ready for British warships.

THE WEEK.

The Swedish inventor, Felix Starkenberg, whose wave motor and unique stern-wheel boat attracted attention, died in Brooklyn last week at the age of 47 years.

The National Lead Company, with an enormous capital, proposed to absorb all the plants belonging to the National Linseed Oil Company, taking possession of the entire field now held by the two corporations. Overtures with this object having failed, oil mills, it is reported, are to be added to some of the lead works with the expectation of ultimately crowding their rivals to the wall. The capital of both concerns is supposed to be inflated many millions beyond the value of the property represented, including their respective trade marks.

A firm of butchers in New York, with \$5,000,000 capital, are establishing large slaughter houses in Kansas City, in competition with firms in Chicago.

An enormous freight house for the Pennsylvania Railroad Company will be added to the plant already owned by that corporation on the Hudson River front above Thirty-seventh street. The land just bought cost \$250,000.

W. K. Vanderbilt's steam yacht "Valiant," building in England, will have two sets of triple-expansion engines to drive her twin screws of bronze. Her indicated horse-power will be 5000, this great power being necessary to drive her 18 knots when loaded, 17 being her guaranteed speed at sea with moderate forced draft. Her length between perpendiculars is 310 feet.

The question of establishing a British labor bureau is under discussion. The Government desire to avoid both ministerial changes and the increase of legislative work. All that is actually known is that the general principle has been agreed to, and that, as soon as matters of detail have been arranged, the labor bureau will be established.

Some of the Panama Canal officials must go to prison for five years, including the veteran president, Ferdinand De Lesseps, and his son Charles. Eiffel, who received a lighter sentence, will appeal.

An Egyptian scythe, dug up on the banks of the Nile in 1890, and said to be as old as Moses, is exhibited in a London museum. The shaft of the instrument is of wood, set with a row of fine flint saws, which are securely cemented in a groove.

The street canals in Venice are frozen over, rendering gondoliers useless, the first time in a century.

Here is Uncle Sam's account with the silver mines up to date:

	Ounces.	Cost.
Purchased under act of 1878.....	288,474,762	\$305,135,497
Sherman act.....	129,926,735	127,237,410
Totals.....	418,401,497	\$432,372,907
Present market value.....		351,457,257
Loss.....		\$80,915,650

These figures are sufficiently eloquent.

Australian public finances make a poor showing when analyzed by intelligent observers in Melbourne. Within a few years half a dozen banks have gone down, entailing losses exceeding 5,000,000 sterling, and although enormous sums have been borrowed by the several governments only a small proportion has gone into works of general utility, so that now the principal difficulty is in obtaining money to settle the interest account. It is stated that altogether the colonies have borrowed in the last four years \$185,000,000.

A correspondent of the London *Economist* writes: "Several of the governments have large deficits yet to meet. The New South Wales Government had used up all available resources, trust funds, savings bank funds, &c., at the time it resolved to try a local loan, and had close upon £3,000,000 to find. The Victorian Government, while showing by bookkeeping entries that it still has a balance available for fresh public works, is steadily exhausting its cash resources, and must by June next be at the point of begging the banks for temporary assistance unless it can float new loans. The outlook is a serious revenue deficit." In Melbourne the depression is without relief.

The formal act of raising the American flag on the Inman steamers "Paris" and "New York" will take place on Washington's Birthday, and it is said that President Harrison and his cabinet will participate in the ceremony. James A. Wright, Jr., vice president of the International Steamship Company, is quoted as saying that the company propose to have built at least six steamships in the United States equal to those just named.

It is noticed as a curious fact that while paper is displacing wood in the manufacture of many articles, wood is displacing the materials formerly used in the manufacture of paper.

The construction of the first Hurst gun, with its "reinforced multicharge cartridge," was commenced in Washington last week, \$50,000 having been appropriated by Congress for this purpose. The sum of \$150,000 was paid for the right to manufacture.

Advices from Buenos Ayres show that, besides revolutionary disturbances within Argentina, relations between that country and Chili are strained to a dangerous point. Complications which arose during the struggle ending in Balmaceda's defeat are still a constant source of irritation.

The Manual Training School report, with its array of 500 boys in the two schools of this character, a Philadelphia paper says, is a gratifying proof of the progress and success of this form of education.

Ice on the lakes is the heaviest for a century. In one place, eight miles from shore, it is eight feet thick.

The naval docks at Brooklyn and Puget Sound are to be lengthened to 650 feet.

There is a financial crisis in Nicaragua.

The Board of Public Works of Austin, Texas, is in the market for about 9000 tons of cast-iron water pipe.

The plans for the new Third Avenue bridge across the Harlem River have been approved by the Board of Estimate and Apportionment and will doubtless be acceptable to the War Department. Including the approaches, this bridge, will cost about \$2,000,000. The total length of the bridge and approaches will be 2324 feet. The bridge will be built of iron and steel, and the approaches will be built of iron and masonry. The central swing span, which will be of steel, will be 300 feet long, and each side of the draw will be 104 feet in the clear. The bridge will have a width of 86 feet. The channel spans will be 26 feet above high-tide mark.

A member of the Dominion Parliament states that \$20,000,000 have been expended on army rifles for that country, and that "gas pipe" would make more efficient weapons. A little while ago Germany, it will be remembered, was agitated by the announcement that a large percentage of the army rifles were defective, and Russia is now reported to have made a similar discovery. In regard to Germany and

Russia the natural inference is that both governments welcome a pretext for preserving the peace.

Large investments in Mexican coffee lands are being made by Mexicans and foreigners, and it is said that \$25,000,000 additional capital could be profitably employed in agricultural development. Mexican coffee finds a ready market.

It is reported that as a result of the Old Colony deal the consolidated road has placed an order for thirty-five new locomotives with the Rhode Island Locomotive Works of Providence.

A bill modifying foreign bills of lading, with the design of protecting American shippers, is likely soon to become a law. The present bills of lading are full of exemptions in favor of the carrier which crept in in times long past, when the risks of ocean carriage were much greater than now and when the carriers were in a position to dictate their own terms to shippers.

The new Waldorf Hotel on Fifth avenue and Thirty-third street cost over \$5,000,000, and the building is as completely fire-proof as it can be made. At each end of the deep building a fire-proof well, lined with fire brick, runs from roof to foundation, inclosing a steel stairway. The greater part of the ironwork was furnished by the Cornells.

Grand Master Sargent of the Brotherhood of Locomotive Firemen contradicts the reports circulated from Chicago that a general strike is contemplated. He says: "There could not be a strike without disrupting the Brotherhood of Firemen and the Brotherhood of Engineers. The constitutions of these orders absolutely prohibit anything of the kind, and I know it to be a fact that were a general strike permissible the men would not be in favor of it."

Halifax papers chronicle another deal in Nova Scotia coal mines by American capitalists.

The cities of St. Paul and Minneapolis have a combined population exceeding 350,000.

Canadians who have been shipping cattle in bond from Boston to Liverpool have been notified that they can do so no more. Until the opening of navigation by the St. Lawrence River Canadian cattle are shut out of the British markets by the scheduling order of last fall and are shut out of the United States markets by the American quarantine order.

A number of leading machine makers have just established a limited liability company, "Technical Office of German Machine Makers," in Hamburg, with the object of pushing the exports of machines.

The *Inter-State Grocer* says that in 1892 the wholesale grocery trade of St. Louis showed an increase of 12½ per cent. over 1891 in the value of goods sold. The greatest increase was in coffee.

The forthcoming sugar crop of Brazil is estimated by United States Consul Stevens at near 225,000 tons. The planting for the crop of 1893-4 is the largest on record.

The whale fisheries last year as a whole were successful. The catch of whales by the combined fleet in the Arctic Sea and South Atlantic was 214, against 212 in 1891. The number of vessels engaged in the business January 1, 1893, was 95, with a tonnage of 21,165, against 92, with a tonnage of 20,845, January 1, 1892, while in 1860 the fleet consisted of 569 vessels, with a tonnage of 176,848.

A bill to prevent tramp steamers transporting merchandise from one American port to another, by making a triangular voyage to a foreign port, has passed the United States Senate.

The Iron Age

New York, Thursday, February 16, 1893.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
 CHAS. KIRCHHOFF, - - - EDITOR.
 GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
 RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
 JOHN S. KING, - - - BUSINESS MANAGER.

Gold Bonds or Repeal?

The bald question now presented in the management of the United States Treasury is the wisdom of borrowing gold for the purchase of silver. The Government, under existing laws for the coining of silver and purchases of bullion, now finds itself encumbered with the metal to the stupendous amount of over 130,000,000 ounces, or about 4880 tons, which are unavailable and practically worthless for shipment to foreign creditors. Otherwise stated, the resources of the Government have been expended to no purpose, until little remains besides various issues of paper and a gold reserve of \$100,000,000, which judicious financiers agree should be permitted to remain intact. To avoid the possible contingency of gold going to a premium there has been much hurrying and scurrying during the last few days. The immediate object was to provide gold supplies sufficient for the emergency, until Congress, under a new administration, shall grapple with the difficulty and devise a remedy. The attempt at best can be regarded as only a makeshift to tide over a comparatively brief interval. Secretary Foster personally called upon the most influential bankers in New York to confer in regard to the wisest course that shall be pursued. Immediately it was ascertained, in response to previous suggestion, that the banks were ready to transfer to the Treasury vaults an amount of gold sufficient at once to remove all apprehension respecting the immediate future. Certainly there was no reason why business should be disturbed in the least by perplexities in the Treasury management pending action by Congress. The idea of gold going to a premium was scouted as quite absurd. "Every obligation of the Government," as one said, "will be paid in gold." Among the various bankers, however, attention seemed to be divided between the expediency of an early issue of bonds, to be floated as occasion might require, or to aim directly at the repeal of the Silver Purchase law, which was conceded to be at the bottom of the difficulty. President Williams of the Chemical Bank said that the issue by the United States of, say, \$50,000,000 in gold bonds, would depress the rates of interest and to that extent check the foreign demand for gold. Otherwise, in his opinion, there was no way of maintaining the parity of the two metals. President Sherman of the Bank of Commerce took the ground that nothing short of repeal could be more than a temporary expedient, arguing that the continual issue of paper could have only one result. Another, illustrating the point, hypothet-

ically referred to the case of a business man who was in debt, and asked if issuing any amount of promissory notes would give permanent relief. The impregnability of the Government credit was referred to by a veteran bank officer, who called to mind the experience of war times, when the Government debt was three thousand millions of dollars; when United States bonds were selling at 90, and when there was no gold in the Treasury—contrasted with which, he said, look at the present situation and the magnificent resources of the country.

One conclusion appears to have become firmly fixed in the minds of leading financiers and business men—namely, that experience under the Sherman law of 1890 has been ample to test its impracticability. When the Sherman silver bill was passed there was \$90,000,000 of gold in the Treasury above the redemption reserve. Where are we now? Of course, the banks cannot be expected to go on indefinitely supplying gold to the Treasury. Large exports of gold are periodical about this season of the year, and there is no probability that 1893 will be an exception with imports at New York heavy beyond precedent—\$59,500,000 for January alone—while exports for the same time were less than \$25,000,000, exclusive of specie. Besides, Austro-Hungary, France, Germany and Russia will all soon be in the market for gold.

Another point: When the act of 1890 was passed the price of fine silver was \$1.08 per ounce and the object was to bring it up to \$1.29 per ounce, making the silver in a dollar of 41 $\frac{1}{2}$ grains worth the same as gold. The sequel is that a silver dollar intrinsically is worth 60 to 64 cents, and that the Treasury has lost about \$100,000,000 in trying an experiment. At last there is a turn in the lane, and the cry is for repeal.

Manufacturers and the Pinkerton Service.

A crop of seven reports has been the outcome of the Homestead Congressional Committee, representing different shades of opinion, without leading to a single suggestion which might be regarded as of service in preventing a repetition of the Homestead scenes. The committee was instructed, at the time, to trace the relation between that famous labor struggle and the tariff, but its members with practical unanimity decline to commit themselves to any statement which would justify the hopes of those who appointed them.

All the reports, with one exception, that of Stockdale of Mississippi, concede the absolute right of a manufacturer to take Pinkerton men into his service as watchmen. The majority report, signed by Oakes, Culberson, Goodnight, Buchanan, Chapin, Wolverton, Taylor and Powers, from the standpoint of the men so employed, say: "One may be lawfully employed to guard the property of his employer, even to the extent of shooting down the incendiary or other person who approaches the same and attempts its destruction, after warning such trespasser to desist." The committee practically reaches the conclusion that Congress has

no control over the Pinkerton service, since the making and enforcing of police regulations rests with the States. So long, therefore, as State laws do not prohibit their employment the owners of property have the right to have it guarded by armed Pinkerton men. Since that right has been denied by a good many well-meaning persons, and since its exercise has been vehemently denounced by labor agitators and demagogues, it is well that its character should be clearly defined and be authoritatively established.

On the question of the expediency of employing Pinkerton men, the reports of the committee very naturally take ground adverse to the manufacturer. In view of the dreadful outcome of the course taken by the Homestead management it is not surprising that the adoption of other measures is suggested as much wiser.

The point is made that the men, believing the use of Pinkerton guards to be unlawful, and having a deep hatred for them, are quick to adopt violent measures against them, when they would be slow to act in the same manner in opposition to bodies of men vested with undoubted authority to protect the employers' property.

It may well be questioned whether those who take that ground understand clearly the temper of some of the men with whom manufacturers have to deal. The majority of American workingmen are law-abiding citizens, but there is a violent class among them whose brutality leads them to jump at any chance to destroy property, and if needs be, to sacrifice life. It is this class which at once resorts to arson and to riot. It is this class which waylays, beats and murders rival workmen, and applauds and encourages any outrages which may be committed in its cause. It is this class which can only be met with rifles, which it respects only when the conviction is general that they will be used to kill.

Manufacturers and employers of labor must be guided in reaching a decision whether or not Pinkerton men should be employed by a study of the character of the men with whom they must deal, with reference to the strength or weakness of the local or State authorities. It is their duty to themselves, to their stockholders and to the better class among their workmen not to shrink from extreme measures if circumstances unmistakably point to their adoption.

The magnitude of the railroad interests of Chicago is shown by some interesting facts recently compiled by a local paper. There are 28 distinct railroad companies, operating 41 roads, on which 1386 trains of all classes arrive and depart daily. Freight trains constitute the smaller part of these arrivals and departures, comprising 274 merchandise trains and 164 grain, stock and lumber trains. The passenger service is divided between 670 suburban and accommodation and 278 through express and mail trains. These 28 railroad companies own or control no less than 40,000 miles of road. Their direct connections, of course, would swell the mileage much higher, as solid trains run east from Chicago to the Atlantic, west to the Pacific, south to the Gulf, &c. It is be-

lieved that no other city in the world can make a showing in any way comparable with this.

The Illinois Steel Company.

The operations of the Illinois Steel Company are of national interest. They are one of the gigantic corporations of the world, employing an army of men and requiring great financial resources to keep their affairs moving smoothly and successfully. The annual meeting of the stockholders was held in Chicago on the 8th inst., at which the officials of the company presented reports of the past year's results, which are extremely interesting. Probably the most satisfactory outcome of the meeting to the stockholders was the declaration of a 5 per cent. cash dividend and a scrip dividend of 13.51 per cent. The scrip dividend is redeemable April 1, 1913, in cash without interest, but possesses greater value by the offer of the company to accept it in payment for 5 per cent. debenture 20-year bonds to the extent of 36 per cent. of their par value, the remaining 64 per cent. to be paid in cash. This scrip dividend represents accumulated profits of the past two years. A financial exhibit submitted by President Jay C. Morse made the following comparative showing:

	1892.	1891.
Net earnings.....	\$2,019,268	\$1,038,776
Capital stock.....	18,650,635	18,650,635
Bonds.....	6,200,000	6,200,000
Per cent. earned on stock.....	10.83	5.6

From this statement it will be seen that 1892 was a better year for the company than 1891, notwithstanding the fact that on most of their products prices were lower than during the previous year, and the collapse of the beam combination cut down profits in that branch of the trade very seriously. This is in part accounted for, however, by the fact that 1891 was a period of much new construction, when the company's works were being put in shape for a much larger output, especially of pig iron. During the year 1892 they received a total of 3,604,964 tons of raw material and shipped 784,732 tons of finished product, the total number of cars of material handled being 143,534. These figures are large, but they only represent a moderately fair year, the works not having been pushed to their full capacity, except for a portion of the year. Should a heavy demand for all iron and steel products give the company a fair opportunity to show what they could do under pressure, their output would be enormous. Even their last year's business was greater in tonnage than that of all Sweden or Belgium or Russia, and probably about equal to that of Austria and Hungary combined. Thus a single American company of comparatively recent establishment distances or rivals whole European countries whose achievements in the manufacture of iron and steel have been famous for generations if not for centuries. An average of 8208 men were employed during the entire year, to whom the company paid \$6,522,352 in wages and salaries.

Of special interest to other American manufacturers is the announcement by President Morse that a new structural mill and universal plate mill are to be erected. These have been contemplated

for some time, but not until now has the statement been definitely made that they will be built. An issue of \$7,000,000 in 20 year 5 per cent. bonds is to be made for the purpose of adding these improvements and completing the open-hearth steel works and plate mill now under construction, as well as to provide the necessary working capital to operate them afterward. The plate plant is known to be of the most improved character, able to compete with any other mill in the country, no pains nor expense having been spared in its construction, and it is reasonable to suppose that the new structural mill and universal mill will also show the most advanced practice and embody the best ideas of modern rolling mill construction. The Illinois Steel Company thus demonstrate anew their determination to control the Northwestern markets in the manufacture of heavy products. The plate mill is now in such shape that it will be ready for active operations during the spring, or at furthest early in the summer. The report touches but lightly on other improvements now being made in the company's plant. Among these are the reconstruction of the Joliet works and additional equipment at the Union works. The changes being made are in the introduction of more automatic machinery to further decrease cost of production, as well as to enlarge the output.

The financial condition of the company on December 31, 1892, is given as follows:

The net earnings of the company from the consolidation of May 2, 1890, to December 31, 1892, were... \$6,117,882.29
From the net earnings as shown above dividends have been declared and paid amounting to..... 2,129,318.56
Leaving 8,988,563.73
Out of which a dividend (No. 4) of 13.51 per cent. was declared February 7, 1893, payable March 10, 1893, in scrip of the company, redeemable April 1, 1913, in cash, without interest 2,519,700.79
And a dividend (No. 5) of 5 per cent. payable April 1, 1893, in cash..... 932,531.75
Leaving an undivided surplus on December 31, 1892, of 536,331.19
The quick assets, as shown by the accompanying balance sheet, consisting of cash, materials and supplies on hand and bills and accounts receivable, amounted December 31, 1892, to..... 15,317,863.35
The quick liabilities, consisting of bills and accounts payable and accrued interest, amounted to.... 7,623,580.68
Leaving a balance of net salable quick assets of..... 7,694,282.67
To which add securities on hand, amounting to..... 2,029,838.35
Making a total of salable assets of..... 10,624,121.02
Less 5 per cent. debenture bonds outstanding (due in 1910)..... 6,200,000.00
Leaving a balance of convertible assets over and above the value of the five plants, including real estate, buildings, machinery, track, equipments, &c., amounting to
4,424,121.02

The balance sheet to which reference is above made is as follows:

Credits.
Capital stock outstanding..... \$18,650,635.00
Five per cent. debenture bonds..... 6,200,000.00
Bills payable..... 3,510,704.48
Accounts payable..... 3,956,776.20
Accrued interest and commissions..... 156,100.00
Reserve funds for replacements, accidents and contingencies..... 403,040.88
Dividends payable March 10 and April 1, 1893..... 3,452,232.54
Profit and loss (undivided surplus). 536,331.19
Total..... \$36,865,820.29

Debits.
Cost of real estate, buildings, machinery and equipment to January 1, 1892..... \$17,911,618.49
Net additions in 1892..... 395,196.36
Materials and supplies on hand.... 10,213,390.22
Cash on hand..... 1,014,830.18
Bills receivable..... 824,915.52
Accounts receivable..... 3,264,727.49
Securities on hand..... 3,321,142.09
Other investments..... 32,000.00
Total..... \$36,865,820.29

The showing thus made is decidedly favorable. Liabilities have been reduced as compared with the previous year, net earnings were nearly doubled, and the works are now in much better shape for pushing business along the entire line than ever before. With such a result, showing most able management, the unanimous re-election of the old directory naturally followed.

Diversified Agriculture.

An economic derangement of some kind in agricultural pursuits is apparent when there is an excessive production of certain commodities, like wheat and cotton, while simultaneously there is a dearth of other important staples, such as hog products, horned cattle and sheep, conditions which we experience in this country at the present time. This irregularity in the relations between supply and demand is attended with an abnormal depression of prices for the one class of products, corresponding with their abundance, and high prices for the other, governed by the degree of scarcity. Both the domestic and export trade are injuriously affected by such a dislocation. On the Produce Exchange the record is made almost on the same day that wheat is selling lower than ever before and that hog products are high beyond precedent. The calculation was lately made that the average of daily quotations for wheat, actual sales in New York, "was the lowest ever recorded in any month during the 67 years of which quotations have been regularly compiled." And as to provisions, it was stated in the market reports for last Saturday that not at any time since the war has the price of hogs been as high as at the present—that the country is being ransacked for stock, and everything having the shape of a hog, no consideration being given to age or quality, is now on the market at sellers' prices. Beef and mutton likewise feel the upward tendency and sell at much higher prices than a year ago.

Cotton is another staple that is going through a crucial period, prices having touched a point where there was said to be no profit for the planter, but the market is now believed to be recovering, as the result of a co-operative movement in all the cotton States to restrict production. Cotton planters, like the Western farmers, have been compelled to precipitate their product on the lowest market ever known.

Although farmers not long ago claimed that there was no profit in growing "dollar wheat," they have, since the last crop, been compelled to content themselves with receiving only from 50 to 60 cents per bushel, according to location.

The St. Paul *Pioneer Press* surveys the situation with reference to wheat, concluding that it is "through diversified farming" that a remedy can be found for unremunerative prices, and the same remark will apply to the whole field of agricultural enterprise. The writer says:

"The plain fact is that there is over-production of wheat. There is more wheat raised in the world than can be marketed, under ordinary conditions, at a price sufficient to give the grower a rea-

sonable compensation for his work. This is the natural consequence of an unprecedented development of the wheat-growing area in the United States. Under the stimulus of cheap lands and low transportation rates the wheat product of this country has increased faster than the world's demand, so that there is a steady surplus."

The visible supply lately accumulated to the before unheard-of quantity of 81,000,000 bushels as a consequence of favorable weather for sending the crop to market and because of the large quantities of old grain held over from the harvest of 1891. Although the turning point was anxiously watched when the flood of grain would begin to recede, elevators everywhere were reported to be full and all side tracks covered with cars.

Therefore farmers are exhorted to "escape from the thralldom of a single-crop idea." The great Northwest, farmers are told, must develop the dairying interest, and devote a larger share of attention to the raising of live stock, to sheep husbandry and hogs. In this last particular there is practically no limit to the field of remunerative enterprise, for, as we are reminded on the best Western authority, this business does not require the abandonment of other farm interests or any especial changes in the farmer's programme. Moreover, aside from a vast home consumption, all foreign countries are now open markets for American hog products.

Secretary Rusk in a recent report expressly points out the necessity for a diversification of crops throughout the country and for a close study of all markets abroad, so that our agricultural products shall be adapted to special demands. The inhabitable globe is now more than ever a unit, as facilities increase for cheap and rapid transportation to every part, and in the arts of agriculture means must be adapted to a specific end.

The Cost of Bad Workmanship, in Shipbuilding.

A well-known Scotch shipbuilder, Robert Caird, in a carefully prepared address delivered recently on the occasion of the annual congress of the Educational Institute of Scotland, illustrated the importance of thorough technical training by presenting an estimate of the outlay now required on the part of British shipowners over and above what would be necessary if the factor due to ignorance and carelessness on the part of workmen could be eliminated. While carelessness will always occur to some extent, yet fewer men are willfully dishonest than ignorantly careless, and hence it follows that the more a man knows of his work the more careful will he be about it. The opinion was expressed that the discipline of technical training, the acquired habit of scientific method, is of itself perhaps the best means of fostering the faculty of taking care, of painstaking, and it was added that no one not engaged in actual constructive work can form any adequate conception of the enormous waste to the world caused by inaccurate, or to speak plainly, by bad workmanship.

Mr. Caird pointed out that Lloyd's Registry practically determines the scantlings to which vessels are built in Great Britain, and in doing this a factor of safety is fixed by the committee in excess of the theoretical strength of the materials of the structure to resist any strains that may occur. This factor is the result of experience of the heterogeneity of the structural material and defects of workmanship. In this it is not even the average that rules, but the worst that the society will pass.

In view of these considerations it was asserted that the exercise of a greater amount of carefulness on the part of workmen, not such as to increase cost, but something quite feasible and reasonable, would warrant a reduction of scantlings to the extent of at least 10 per cent.

Taking this assumption as a basis, Mr. Caird stated that he had made a calculation which showed that in the mercantile marine of Great Britain there is invested over \$25,000,000 in excess iron and steel employed in the construction of steamers, an excess which is required and is carried about simply as an allowance for bad workmanship. The calculation showed further that over \$1,000,000 worth of coal is burned annually in propelling this surplus material which should be quite unnecessary.

Another point touched upon was that the relative importance of good workmanship is constantly increasing. Every day the testing of materials is becoming more thorough and complete, and as a result, and perhaps more so as a result of the progress of metallurgical science and practice, materials are becoming more homogeneous and more uniformly reliable. New alloys, such as nickel steel and others, promise in the near future to furnish materials of greater strength and reliability than are available at present, so that the element of workmanship in the factor of safety will assume even greater importance. If full advantage is to be taken of the superior qualities of strength and ductility of these new substitutes for steel and iron, the workmanship, the fitting and securing of the parts, must keep pace with the materials in improvement.

The shipbuilding establishment with which Mr. Caird is identified has turned out a number of very fine, large and well known ocean steamships, and he is, therefore, well qualified to express an opinion on questions connected with shipbuilding.

OBITUARY.

WILLIAM T. CARTER.

William T. Carter, the extensive coal operator and iron manufacturer, died in Philadelphia, 9th inst., after a short illness, from pneumonia. He returned on Saturday from a visit to his mines and furnace in the Lehigh Valley, apparently in perfect health, but was stricken that evening. Mr. Carter was an Englishman by birth, but had lived in this country since his boyhood.

ARTHUR T. WOODS.

Prof. Arthur T. Woods, formerly professor of mechanical engineering at Illinois State University and later professor of dynamic engineering at Washington Uni-

versity, St. Louis, died of typhoid fever at the Granada Hotel, Chicago, February 7. He was a graduate of Annapolis Engineering School and was the Chicago editor of the *Railroad Gazette*.

ALLEN M'KAIN.

Allen McKain died at his home in Auburn, N. Y., February 7. He was born in Rochester February 17, 1840, and went to Auburn in 1860. He entered the employ of D. M. Osborne & Co. in a subordinate position and by his ability arose to the rank of assistant superintendent of the extensive plant. Later he was given entire supervision of the malleable iron works and rolling mill. Mr. McKain continued with Osborne & Co. until failing health forced him to retire last November.

CHARLES SWEATT.

Charles Sweatt, president of the Sweatt Mfg. Company, Minneapolis, Minn., whose death was recently announced, was born in Orange County, Vt., on May 30, 1832. In 1857 he went to Iowa and located in Mitchell County, in that State. From that time until 1878 he was prominently identified with the settlement and development of Northern Iowa, having been connected with a general mercantile and banking business of West Mitchell. In 1878 he removed to Fargo, N. D., where he established a bank, with which institution he was identified until 1886, when, on account of failing health, he sold out his interests and located in Minneapolis, where subsequently he engaged in the manufacturing business and organized the Sweatt Mfg. Company, of which concern, as above mentioned, he was president at the time of his decease.

The Tin Petition.

In view of the fact that a duty of 4 cents per pound is to be imposed on pig tin after July 1 of this year, a petition is being circulated by T. J. Pope's Sons & Co. of 292 Pearl street, New York, which is to be presented to Congress, asking that that section of the McKinley bill be repealed. It is claimed that it is now evident that tin mining in this country has not been a success and that the production of pig tin could not reach 5,000 tons per annum during the next two years, as would be necessary under the McKinley bill; fear also being entertained that the existing state of affairs will lead to disastrous speculative operations, consumers of tin in all forms are being asked to sign the following petition:

Whereas, By the law passed in October, 1890, and known as the McKinley bill, pig tin is subject to a duty of 4 cents per pound, to take effect on and after July 1, 1893, with a proviso that unless the production of pig tin in the United States is shown to be 5000 tons per annum, during the ensuing two years, the duty should thereafter be abrogated, and whereas, from competent and expert testimony it is already known that the home production of the article cannot, in all human probability, amount to anything approaching the quantity named of 5000 tons per annum, the undersigned, your humble petitioners, respectfully represent that it is extremely unjust to the people of the United States, and more particularly to those directly interested, as consumers of an article of prime necessity to the industries and arts, that the said tax should now be imposed. Pig tin is a raw material, practically unproduced in the United States, and has been for many years on the free list.

The importations now reach an aggregate of about 21,000 tons per annum, the duty on which at 4 cents per pound will amount to nearly \$2,000,000.

We further respectfully represent that the imposition of a tariff upon pig tin is directly opposed to the tin-plate industry, which it is so desirable to introduce and foster in this country, and toward which commendable progress has already been made.

In view therefore of the facts above stated, we humbly petition that the law, so far as

relates to the imposition of a duty on pig tin, may be promptly repealed or its operation suspended.

The petition has not yet been issued to the New York trade, but in the quarters where it has been circulated it has met with a considerable response. The signers to date are as follows:

Michigan Brass & Iron Company, iron and brass founders, Detroit, Mich.
Western Electric Company, electrical goods, Chicago, Ill.
John T. Noyes Mfg. Company, mill machinery, Buffalo, N. Y.
J. M. Batchelor, financial editorial writer, Brooklyn, N. Y.
Hook & Hastings, church organ builders, Boston, Mass.
Meneely & Co., bell founders, West Troy, N. Y.
J. Regester & Sons, bells and brass work, Baltimore, Md.
Meriden Britannia Company, silver-plated ware, Meriden, Conn.
Granular Metal Company, Boston, Mass.
Ebel & Co., saddlery hardware, Canton, Ohio.
Westinghouse Machine Company, steam engines, Pittsburgh, Pa.
C. Van Norden & Co., solder makers, Boston, Mass.
Standard Stamping Company, tin ware, St. Louis, Mo.
Cincinnati Lead Pipe & Sheet Lead Works, Cincinnati, Ohio.
East Hampton Bell Company, bells, East Hampton, Conn.
Starr Bros. Bell Company, bells, East Hampton, Conn.
Gong Bell Mfg. Company, bells, East Hampton, Conn.
L. M. Rumsey Mfg. Company, manufacturers and metal dealers, St. Louis, Mo.
Covert Mfg. Company, hardware specialties, saddlery, West Troy, N. Y.
E. F. Kirwan Mfg. Company, tinware, Baltimore, Md.
Geo. R. Meneely & Son, brass founders, West Troy, N. Y.
R. Tyne Smith Can Company, tin goods, Baltimore, Md.
Boyden Brake Company, car brakes, Baltimore, Md.
Troy Nickel Works, stove trimmings, Troy, N. Y.
Samuel Pierce, metal organ pipe manufacturer, Reading, Mass.
Chas. G. Summers & Co., can makers and packers, Baltimore, Md.
Wm. Litchfield, copper and brass founder, Charlestown, Mass.
John L. Finney & Bros., vegetable and fruit packers, Aberdeen, Md.
R. Emery, can packer, Taylor P. O., Md.
Harry Lambert, packer of canned goods, Salem, N. J.
Great Western Smelting & Refining Company, Chicago, Ill.
Wm. Powell Company, brass founders, Cincinnati, Ohio.
F. H. Lawson & Co., dealers in tin plate and metals, Cincinnati, Ohio.
Fait & Slagle Company, oyster and fruit packers and manufacturers of tinware, Baltimore, Md.
J. F. Brady & Co., packers of canned goods, Bridgeton, N. J.
Wm. King & Son, church-organ builders, Elmira, N. Y.
H. W. Colter Canning Company, fruit canners and can makers, Mount Washington, Ohio.
H. F. Stern, canner of fruits and vegetables, Zanesville, Ohio.
Excelsior Brass Works, brass goods, Duquesne, Iowa.
A. F. Brown, packer, Havre de Grace, Md.
F. M. Anderson, canner, Keokuk, Iowa.
Baltimore Chemical Company, manufacturers of chemicals, Baltimore, Md.
P. O. Klinefelter, tinware, roofing, &c., New Freedom, Pa.
Sidney Shepard & Co., tinware manufacturers, Buffalo, N. Y.
Enterprise Mfg. Company, hardware, Philadelphia, Pa.
Automatic Switch Company, Baltimore, Md.

It will probably be two or three weeks more before the canvass will be completed and the petition in proper shape for presentation to Congress.

It is reported on good authority that the Colts Firearms Mfg. Company of Hartford, Conn., are to take up the manufacture of the Savage repeating rifle, invented by Arthur Savage of Utica, N. Y. Mr. Savage is now in Hartford and will remain there for some time. Some of the advan-

tages of the Savage rifle are that it is adapted to the use of modern cartridges loaded with nitro powder and jacketed bullets; that the smokeless powder used does not obscure the operator's aim or expose his position; that the gun can be fired 1000 times without being cleaned; no leading or rifling grooves in the barrel, necessary hard metal shell bullets being used; that greater velocity can be obtained and that the rifle can be used up to 500 yards without changing the sights; lighter or smaller cartridges are used with higher penetration; that it carries more accurately and further than guns employing black powder; less recoil and less noise; no alteration of balance of rifle necessary, as magazine cartridges are expended; no danger of explosion of cartridges, as each cartridge is held by the rim and separated from the others in the magazine, thus obviating the danger of an explosion; the bullets used are pointed and not cut-off square, and there is consequently less resistance to air and more accuracy; cocking and firing mechanism at the closing movement of the lever and not at the beginning of the movement, thus holding the rifle to the shoulder and not pushing it away when operating the piece as a magazine arm, and thus rendering the gun safe in loading; easier action; shells ejected to right of operator and not toward face of operator; magazine can be easier and more quickly loaded; single loader and magazine rifle combined, without automatic cut off; magazine can be held in reserve while using piece as a single loader; no danger of gas in the face of the operator; harmless; no hammer to interfere with sight or distract operator's aim or catch in strap or wire, &c., with consequent possibility of accident; magazine protected against accident by strong walls of frame; more powerful extractor; has stood a very severe United States test for endurance, excessive charges; that it has a less number of parts and springs. The rifle is composed of two parts wood, twenty parts metal, ninety-nine screws, nine pins and four springs.

The annual report of the National Linseed Oil Company shows as follows:

Liabilities.

Capital stock.....	\$18,000,000
Bills payable.....	4,025,881
Total.....	\$22,025,881

Assets.

Real estate and equipment.....	\$8,984,221
Cash.....	4,436,923
Bills receivable.....	1,215,584
Stock.....	2,919,235
Quick assets.....	4,571,803
Cash valuation.....	18,556,024
Balance, including good will, patents, &c.....	8,496,856

Total..... \$22,025,881

The sales of oil were 31.2 per cent. greater than in 1891. By improved mill methods the company saved \$108,523 on the season's operations and a dividend of 2 per cent. semi-annually was expected. The president says: "We hope that the increase of business will cause dividends to be resumed at an early date."

The National Lead Company will hold their annual meeting to-day. We understand from good authority that the statement for the year ending December 31 will show net earnings of about \$800,000 after the payment of 7 per cent. upon the preferred stock. The question of a dividend on the common stock is now being considered by the Board of Directors, who have been in session for two days, and will probably be announced to-day. Wall street confidently expects that dividends will be commenced at the rate of 4 per cent. per annum, the first one being 1 per cent. quarterly. The price of the stock,

which is ranging around 48 and 49, would seem to indicate this amount. It is stated in a semi-official way that it will be paid.

The Worthington Pump Company.

An officer of the New York Guaranty & Indemnity Company informs a reporter of *The Iron Age* that subscriptions for this company's preferred stock, which opened on Saturday, have been sufficient to take nearly all of it, and warrant the statement that the books will be closed within a few days. Indications are that the stock will be largely over-subscribed. Subscriptions are reported to be for heavy blocks of stock, and are widely distributed. The insiders are said to lead the list.

The stock which is offered is \$2,000,-000 7 per cent. cumulative preferred. There are \$5,500,000 of the common stock, which is not at present offered. There is no bonded or floating indebtedness, and no mortgage can be placed on the property except by consent of 75 per cent. of the preferred stock. The earnings of the company are \$480,079, the amount required to pay dividends on the preferred stock, \$140,000.

Barrow, Wade & Guthrie have made an examination of the property and find that the various assets on April 1, 1892, were as follows (the liabilities will form no part of the transfer to the new corporation, consequently they are not given):

Real estate.....	\$582,477.91
Tools, fixtures and patterns.....	1,249,254.03
Pumps, completed and in process, raw material, &c., at cost, at works and foundries, New York, and on consignment.....	954,809.04
Bonds and stocks.....	64,235.43
Worthington Pumping Engine Company.....	325,000.00
Book accounts receivable.....	513,831.70
Bills receivable and cash.....	76,754.69
Total.....	\$3,766,453.80

This does not include any valuations for patents.

The Board of Appraisers estimate various chattels and real estate at \$3,156,731.

The business of the company was founded by Henry R. Worthington in 1842. Their hydraulic works cover two city squares in Brooklyn and 8 acres of land at Elizabethport. The business developed from that date until the year 1890 and 1891, when 145 pumping engines were built, with an aggregate daily capacity of 594,000,000 gallons. The various plants employ 1750 men in this country and 400 in England.

The board of directors of the Illinois Steel Company, re-elected on the 8th inst., is composed as follows: H. H. Porter, A. J. Forbes Leith, Morgan Rotch, N. Williams, N. Thayer, Marshall Field, W. R. Stirling, Robert Forsyth, Francis Bartlett, Jay C. Morse, H. S. Smith. The directors at a subsequent meeting elected officers as follows: President, Jay C. Morse; first vice-president, W. R. Stirling; second vice-president, H. S. Smith; treasurer, J. C. Stirling; secretary, H. A. Gray.

Owing to the hostility toward large corporations, the National Cordage Company refused to make any but the briefest report at their annual meeting last week. This is as follows: Balance from last year, \$106,313; profits during the year, \$2,710,749; amount paid in dividends, \$1,450,000; balance carried forward and applicable to future dividends, \$1,367,063.

The Nicaragua Canal Company expended during the last two years \$2,648,000.

The New British Labor Department.

It is announced that the labor department, hitherto a branch of the Board of Trade of Great Britain, is to be entirely remodeled, with the view of increasing its efficiency and fulfilling more completely the requirements of modern economic conditions. The scope of the reorganized department, as outlined by President Mundell of the Board of Trade, shows that it has been conceived in a very broad and comprehensive spirit, and marks a decided step in advance. So far as the difficult question of labor and capital and kindred matters can be handled by Government, the new labor bureau should have a large field of usefulness before it. It is no longer to be a mere appendage to the Board of Trade, but is to be independent, and yet to derive all the advantages of a certain connection with the parent department. The bureau is to be divided into three sections: Labor, commercial and statistical; the whole to be placed under R. H. Giffen, the eminent political economist and statistician, as controller-general. Of the three sub-correspondents of labor, one is to be a woman. The department will issue a journal, the *Labor Gazette*, which at first will be published monthly, but will probably soon be issued at more frequent intervals. The publication is to contain reports of trade disputes, industrial negotiations, sliding scales, changes in the volume of employment, and, in fact, everything connected with the interests of labor. Among the duties of the department will be inquiries into the causes of fluctuations in employment and wages, child labor, unhealthy trades, alien immigration and other topics of pressing interest, for which it will endeavor to find means of regulation. Time will be required to prove how far this new government factor will tend to ameliorate the present unsatisfactory condition of the English labor market; but it certainly seems to contain the promise of good work. That the change has been inaugurated with a genuine desire to promote the true interests of the workingman is evidenced by the fact that posts in the department have been offered to several prominent representatives of labor in the United Kingdom.

The American Lamp & Brass Company.

The American Lamp & Brass Company, Trenton, N. J., have been incorporated, with a capital stock of \$1,000,000, and are the strongest organization of lamp manufacturers in the United States, if not in the world. They embrace three large plants devoted exclusively to the manufacture of lamps; the Great Pioneer, the Great Empire and the works of the Clark Bros. Lamp, Brass & Copper Company.

The officers of the company are as follows: W. R. Whitehead, president; P. K. Clark, first vice-president; J. Y. Clark, second vice-president; Charles Clark, treasurer, and F. B. Clark, secretary. It is stated that none of the stock of the company will be placed on the market, and that the main object in consolidating the interests of the companies is to make their great capacity available for a still greater output of lamps and to create a more economical system of operating the three factories as distinctly individual departments of one great factory under one management. It is the purpose of the company to strictly maintain the individuality of the respective factories as they now stand, which is referred to as indicative of the fact that nothing in the nature of a trust is contemplated.

Virginia's Iron Prospects.

Though there has been a remarkable increase in the development of the iron ore fields of Virginia in the last few years; there is, in fact, comparatively little known of her real wealth. The extensive mountain ranges, which produce such a variety of mineral waters, and seem to abound in mineral, are to a great extent owned by foreign capital, bought in large tracts at low figures. With the small tax levied on this class of land, together with the rapid increase in value, capitalists are encouraged in holding it. This, however, does not seem to have affected the steady growth of the pig iron industry, which statistics show to have made the greatest strides in the last two years of any State in the Union, with an increased production in 1892 over 1891, against the depressed condition of the market. The last year mentioned is the one in which Virginia reached the zenith of her boom-town craze, and in that connection built a crop of furnaces to help the sale of town lots. In this she, to a great extent, overreached herself, and, together with some other Southern States, furnished a factor of considerable importance in causing the present condition of the market.

Had it not been for the extraordinary development of the coking coal in the Pocahontas and New River regions of Virginia and West Virginia, it is more than probable that, out of a total of 22 stacks, more than nine (which is the present number out of blast) would have been forced out of the market.

There is, however, no doubt that the experience of the last two years has not been entirely void of good effects. In the first place, it has carried with it a compulsory lesson in economy, and furnaces and mines are better handled to day than they have ever been before. In the second place, to reach the Northern market it has to a certain extent forced Southern railroads to make freight reductions, and is bound to do so to a greater extent in the future. Again, in finding a market for their iron it has led the producers to endeavor, in which to a great extent they have met with success, to teach the trade how to more advantageously use their irons so as to give satisfactory castings.

The following table show the contrasts of representative samples of ore from widely distant points, ranging from the Blue Ridge to the Allegheny Mountains:

	Iron.	Phosphorus.	Manganese.	Insoluble.
V.....	46.07	0.58	1.69	14.43
R. P....	45.35	0.2	0.35	18.85
K. & F.	48.21	0.41	0.16	14.12
L. R....	44.87	0.58	0.23	22.60
K. & S....	42.78	0.76	0.14	24.32
O.....	44.14	0.29	0.23	23.28
B. R....	46.79	0.27	0.48	18.09
M. V....	51.97	0.92	0.10	12.46
H.....	46.33	0.32	0.64	19.93
Ctp....	43.22	0.47	2.23	18.40
Hbg....	51.34	0.37	trace	14.40
F.....	48.36	0.03	trace	14.92

Most of the above ores are limonites, though a few are hematites. The one marked Hbg. represents a very large undeveloped body of fossil ore, so located as to be mined at a very low cost. The F. sample, which is the only one that would answer for the production of steel by the ordinary acid process, probably represents only a small deposit. Among the remaining, all of which represent large bodies, there are a few that could be used in the basic process; while the majority of these ores make an iron with a grain equal to any No. 1 Foundry; and though a little light in color, and in some instances apparently hard, the manganese seems, in a large degree, to neutralize the bad effects of the phosphorus, leaving a comparatively strong iron.

A knowledge of the above facts has led furnace men in the last few years to make

irons to meet required analyses. The Southern Iron Company of Chattanooga, Tenn., the Ashland Steel Company of Ashland, Ky., and the Old Dominion Iron & Nail Works Company of Richmond, Va., are fair examples of what success can be met with.

The mines being worked at present in this section of the State are, in most every instance, highly elevated, enabling their being worked mostly by open cuts and tunnels, and hence the comparatively low cost.

At the Victoria mines ore is placed in the stockhouse, a distance of 10 miles, at a cost of \$1.20 per ton, making the total per ton of iron \$2.58. These mines are so situated as to be easily workable from several different levels and are entirely free from water. At Rockbridge Furnace, where this ore is used, iron can be made at the following cost:

Coke.....	\$3.78
Ore.....	2.53
Limestone.....	50
Salaries and labor.....	1.35
Incidentals.....	60
Total.....	\$8.76

With the Commissary Department, income from rents, &c., it leaves the real cost a little over \$8 per ton.

This plant is a good illustration of the advancement in management made by Southern furnace men. It was built in the year 1884 and operated for a short time by an English company who, entirely unable to make iron, met with complete failure.

The State shows an abundance of good limestone in every section, leaving nothing to be imported. Besides containing everything within her borders for the production of pig iron, Virginia also produces more than 50 per cent. of the only foreign element needed in the manufacture of steel—that of manganese. The celebrated Crimora Mine, which has probably produced four-fifths of all the manganese mined in the United States, is in Augusta County, and is only rivaled by some very rich deposits in Rockbridge County, yielding as much as 60 per cent. of metallic manganese. The State also produces considerable manganeseiferous iron ore, used for the production of spiegel.

A matter of considerable interest to many furnace men at present is the use of the by-product from the manufacture of sulphuric acid. This industry has grown to be quite an item in the last few years, and the product left after the use of the pyrites shows a good percentage of iron, though it carries from 4 to 5 per cent. of sulphur which constitutes its great objection.

The World's Wheat Product.

The Liverpool *Corn Trade News*, January 24, says: It is now possible to compile a thoroughly reliable statement of the production of wheat in all the more important countries. Official reports have been published of the 13 chief wheat-growing countries, and we produce the results in a tabular form, omitting all the minor countries and only showing what has actually been officially estimated. The crops of the Southern Hemisphere we omit altogether in the present table, as they come to maturity in the middle of the ordinary cereal season, and render comparisons difficult or misleading. It will be noticed that many of the previous seasons' estimates have been revised for the second and third time in the light of after information. The remaining countries not included in the tabular statement grow about 10 per cent. of the world's total crop, as known to the trade; the totals of the four years now under review represent, therefore, 90 per cent. of the total product. Any variation in the yields of the unre-

ported crops would not affect the grand total more than 1 or 2 per cent. We now give the crops of the 12 chief countries in millions of bushels, ,000,000 being omitted for want of space:

	1892. Bush.	1891. Bush.	1890. Bush.	1889. Bush.
United States.....	515	611	509	490
Russia and Poland..	260	176	216	208
Ontario and Mani- toba.....	43	56	37	31
France.....	312	212	328	314
India.....	216	275	226	238
*Germany.....	97	85	93	104
Austria.....	46	39	42	36
Hungary.....	134	135	150	92
United Kingdom ..	61	75	76	76
Italy.....	111	138	128	100
Spain.....	76	72	75	75
Roumania.....	58	56	72	54
Total, 12 coun- tries.....	1,020	1,028	1,842	1,818

* Very unreliable statistics.

MANUFACTURING.

IRON AND STEEL.

At the New Buffalo Furnace of the Union Iron Works, which we noted last week as being about ready to go in blast, the cinder will be handled with the Ridgway steam hydraulic system of cranes, the order for which has been placed.

The New Philadelphia Iron & Steel Company of New Philadelphia, Ohio, have concluded to adopt the Ridgway system of steam hydraulic cranes for handling their material, and the first order for them has been placed with the Messrs. Ridgway of Coatesville, Pa. It is expected these cranes will make a great saving in the cost of handling goods. On these cranes the trolley is automatic. The load is picked up at a point near the post of the crane and the trolley weighs it. The crane is then swung to where desired and the trolley runs off itself out to the extremity of the jib and deposits the load. No special mechanism is used to move the trolley, but it goes by its gravity.

The Spathic Iron Company of Florence, Ala., which recently acquired the North Alabama Furnace property, have absorbed the Shoal Creek Iron Company by canceling the stock of the latter company and issuing in lieu to the holders the Spathic Iron Company's stock.

It is announced that the Riverside Iron Works of Steubenville, Ohio, will resume operations in two weeks. The improvements and repairs to the furnace have been completed, and the men have been notified to report for work.

The citizens of Pomeroy, Ohio, are exercised over the rumor that the plant of the Union Iron & Steel Company, located at that place, is likely to be removed to some other locality.

About half the force employed previous to the shutdown by the Troy, N. Y., Steel & Iron Company have been put at work again preparing the works for a complete resumption of operations. The plant has been shut down about five weeks, and when the men were notified that the works were to reopen they were informed that a new schedule had been prepared. There has been a reduction in the prices paid the tonnage or piece men. Day laborers will, as heretofore, receive \$1.25 per day of ten hours. The beaters and pit hands received the largest wages under the old system and made from 20 to 35 cents per hour, or from \$2 to \$3.50 per day. Under the new schedule they will receive from \$1.50 to \$3 a day. It will be some time before the full force can be put at work, as the steam and water pipes had all been torn out and will have to be replaced, the cupolas rebuilt and many repairs made.

The Court of Common Pleas of Lebanon County has made an order appointing John W. Killinger receiver of the Lickdale Iron Company, which own and operate a steel plant at Lickdale, Pa. The appointment was made upon application of attorneys for Dr. Samuel Weiss, executor of the estate of the late John S. Lick, the principal stockholder and creditor. The company owes the Lick estate on bonds and book accounts over \$150,000.

T. T. Hillman, George L. Morris and J. A. Stratton have incorporated the Gadsden Coal, Iron & Railroad Company, at Gadsden, Ala., with a capital of \$100,000, to mine and sell iron ores, coke and build railroads, &c.

The Tennessee Coal, Iron & Railway Company have applied to the Alabama Legislature for a charter in that State, with a capital of \$40,000,000. The company at present only have charter in Tennessee, and as their largest operations are in Alabama they desire a charter in that State also.

The extensive repairs which are being made on the Woodstock coke Furnace No. 2, at Anniston, Ala., will be completed in about a month, and the plant will at once resume operations. This will be the first time both plants have been in operation, and Furnace No. 3 will also soon blow in.

The Virginia Steel, Iron & Slate Company, at Howardville, is in the hands of a receiver.

Application has been made for the appointment of a receiver for the Woodstock Iron Company of Anniston, Ala.

The Southern Iron Company, which recently took down its two charcoal furnaces at West Nashville, Tenn., have one about re-erected at Allen's Creek, Wayne County, Tenn., and expect to put it in blast by March 1. The other is far advanced in construction and will be completed within 60 days.

There is a rumor in circulation at Birmingham, Ala., that H. F. De Bardeleben is to succeed Thomas C. Platt as president of the Tennessee Coal, Iron & Railway Company.

The Tennessee Coal, Iron & Railway Company have leased the old Henderson steel plant at New Birmingham, Ala., which was recently put in operation by the Jefferson Steel Company. The lessees take charge of the plant and ovens, and will at once commence a series of experiments in steel making. They expect to be able to make a favorable report based on practical tests at the annual meeting in April.

The Circuit Court of the United States has ordered the sale of the Star and Crescent Furnace, the plant of the Cherokee Iron Mfg. Company at Rusk, Texas, for the sum of \$115,000, which amount will be applied to the paying off of the creditors of the concern. The affairs of the company were placed in the hands of a receiver last May and a great deal of litigation has ensued. It is said that parties are negotiating for the purchase of the plant and that it will soon be placed in operation.

It is stated that the Mary Pratt Furnace Company's stock at Birmingham, Ala., will be sold March 9 at public auction.

Operations have been commenced at the Baxter Wire Nail Works at Bridgeport, Ala. This is the first plant of the kind in the South.

During January the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, gave the firm some trouble, and as a consequence was blown out. The furnace will probably resume operations within the next few weeks, as it will not be necessary to reline.

At Pittsburgh last week, Brown & Co., Incorporated, of the Wayne Iron & Steel Works, of that city, filed a bill in equity against the Equitable Natural Gas Company of Pittsburgh, asking for an injunction against the defendant company to restrain them from demanding increased rates for fuel over those specified in a former contract and to restrain them from cutting off the supply unless increased rates are paid. The bill alleges that the firm of Brown & Co. subscribed for 300 shares of the gas company's stock and made a contract with the company for fuel on August 1, 1889, with the understanding that the prices named therein should not be changed so long as the company remained stockholders. They canceled all their gas contracts with other companies and patronized the Equitable in order to help it along, and would not have done so if the defendant company had not entered into the agreement not to increase the rates. On January 31, 1893, a notice was served on the plaintiffs that if the new rates, which went into effect several months previous, were not accepted by February 11, the supply would be cut off. A preliminary injunction was granted pending a final hearing.

Furnace I of the Carnegie Steel Company, Limited, at Bessemer, Pa., was badly wrecked last week by an explosion, and one of the workmen was fatally burned. It is thought that the foundation of the furnace has been seriously damaged, and it will be some time before it will be ready for blast.

The Carnegie Steel Company, Limited, of Pittsburgh, have recently made additional purchases of land adjacent to the Edgar Thomson Steel Works at Braddock which will probably be utilized for the further extension of that plant.

The Muskegon Iron & Steel Company of Muskegon, Mich., have recently done some splendid work on their small mill. On November 19, 1892, which was Saturday, and is well known to be a short day on a rolling mill, their 9-inch mill rolled from a 40-pound pile made of $2\frac{1}{2} \times \frac{1}{4}$ scrap bar piled three high 47,374 pounds, $\frac{3}{8}$ -inch round finished iron. This was exclusive of all crops and defective iron. This was made inside of the Amalgamated Association's regulation working hours and 15 minutes to spare. It was not done to make a large turn, as if this had been the aim they should certainly have selected some day besides Saturday. The iron, they advise us, was as handsome a lot of round iron as any mill ever produced. Every bar was allowed to run in and out, not one bit of looping done on the mill. This was certainly a remarkable turn, even without taking into consideration that the sizes this mill usually runs on are $\frac{1}{2}$ to 1-inch round. The company state that any one doubting this work can be furnished with affidavits of the facts.

The employees of the Albion Malleable Iron Works, Albion, Mich., have struck for higher wages. The works closed down, but an early adjustment of the trouble is expected to take place.

The plant of the United States Rolling Stock Company, at Anniston, Ala., will be sold at public auction on March 9.

At a meeting of the stockholders of the Slatington Rolling Mill Company, Slatington, Pa., held at that place last week, the following directors were elected for the ensuing year: John F. Unger, Philadelphia; Wm. P. Hopkins and

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 14, 1893.

The Secretary of the Treasury is very much gratified at the continued favorable output of tin and terne plate under the impetus given to that branch of industry through the stimulating effects of the protective provisions in the Tariff act of 1890. As those provisions are binding for the term specified, any change would be a breach of faith on the part of Congress and the Executive.

The report of Special Agent Ira Ayer on tin and terne plate production in the United States will not be completed for some days. The following is an extract from a letter to the Chief of the Customs Division, United States Treasury, on the subject:

"You will be glad to know that the production for the last quarter (December 31, 1892) is very nearly 20,000,000 pounds of tin and terne plates proper, besides the manufactures of American sheet steel tinned. This is nearly double the production for the previous quarter. The number of producers is the same as the previous quarter, viz., 32."

The ballistic tests of armor plates at Indian Head having fully sustained the stringent requirements of the specifications for armor plates under the bids invited, the Secretary of the Navy found no change in detail required.

The scientific deductions of the tests are not quite prepared, but in a general way it can be said that the American nickel steel Harveyized armor plate is without its equal, or even approximate equal, in the product of any establishment of any armor-plate manufacturing country on the globe. It is claimed that these recent tests will revolutionize that industry in England, France and Germany. In the United States this is regarded as but the beginning of even greater discoveries in the same line.

Lake navigators are looking for a brisk business in the spring, the prospect being that nearly as much ore will be offered for transportation as there was a year ago, while the grain accumulated will be nearly double. The disturbing question relates to sailors' wages.

The water works just completed in Havana have been in process of construction 35 years, and the work has cost \$14,000,000. During the last two or three years the work has been carried on by an American company, Runkle & Smith, the Spanish Bank of Havana advancing the funds necessary to complete the work.

E. M. Earle of Catasauqua; Henry Kuntz, E. D. Peters, Frank Jacobs, A. S. Haines, Peter Gross and Elias German, Slatington.

The lack of water has been felt among the iron industries at Troy, N. Y. The recent thaw aided some, but not materially. The Burden water mill has started with a full force, but at the Albany Iron Works only the axle hammer furnace and the 18-inch train have been lighted.

The Minneapolis Bridge & Iron Company, capitalized at \$150,000, have filed articles of incorporation at Minneapolis, Minn.

Furnace D of the Crane Iron Company, at Catasauqua, Pa., was blown out last week for the purpose of being relined and otherwise repaired.

Furnace No. 1 of the Thomas Iron Company, at Hokendauqua, Pa., was blown out last week for repairs. No. 2 Furnace of the above concern has been undergoing repairs for some time.

At a meeting of the Board of Directors of the Mahoning Valley Iron Company, Youngstown, Ohio, held last week, C. D. Arms was elected president to succeed Henry O. Bonnell, deceased.

Machinery.

John Maslin & Son of Jersey City, N. J., announce that having increased their manufacturing facilities they are now offering their steam vacuum pumps at reduced prices. They have also reduced the prices on the duplicate parts for old-style pumps.

J. W. S. Creighton, J. R. London and others have secured a charter for the Rock Hill Machine Works, at Rock Hill, S. C., with \$10,000 capital to establish a foundry and machine shop.

The machine shops and roundhouse of the Pittsburgh & Western Railroad, at Allegheny, Pa., have been destroyed by fire, entailing a loss of \$35,000. Much valuable machinery was destroyed.

The Harrisburg Foundry & Machine Works are busy in all their departments and have been compelled to put in a good deal of overtime since the 1st of the year. Among their recent shipments is comprised: Two 300-ton Ideal compound engines to Wilkesbarre, two 150 Ideal to the United States Government at Portland, Ore.; two of 300 horse-power for the Electric Light Company at New Britain, Conn.; two 300 horse-power to drive the shafting in the Machinery Hall at the Columbia Exhibition, two Tandem compounds, 150 horse-power for Porto Rico, and two 80 horse-power for Australia. Also two engines for the Broadway Cable Station, New York City, with Siemens-Halske dynamos attached to the crank shaft, and for the *Mail and Express* four Ideal engines with Waddell-Entz dynamos attached to crank. They have recently made large additions to their plant, including a Morgan hydraulic riveting plant, a 10-foot Niles boring machine, two 60 x 25 lathes, and 12 inches plate bending rolls. The boiler department and machine shop have been considerably enlarged, and they now expect to fill orders promptly.

The Pennsylvania Diamond Drill Company of Birdsboro, Pa., have just completed two rocker crushers weighing 60,000 pounds each, with a crushing capacity of 100 tons per hour, and two weighing 30,000 pounds, with a capacity of 50 tons per hour.

The McKenney Derrick Company, capitalized at \$10,000, have been organized at Lincoln Center, Maine, for the purpose of manufacturing the McKenney derrick.

Austin Bros. & Porter's foundry and machine works, at Tyrone, Pa., have been destroyed by fire, together with valuable patterns, at a loss of \$20,000.

A disastrous explosion occurred at the Star Foundry, Worcester, Mass., by which 15 workmen were more or less seriously injured, and the building badly wrecked.

The Superior Machine Company of Cleveland, Ohio, have been incorporated for the manufacture of gear-cutting machinery. Capital, \$25,000.

The Jackson & Woodin Mfg. Company of Berwick, Pa., have added a No. 8 Whiting cupola to their plant. This is the third cupola of this make in these works.

The Moore Mfg. & Foundry Company of Milwaukee, Wis., are putting on the market a new 10-ton differential chain pulley block, and are preparing a 4-ton size. Their line of differential blocks will then be complete. They are having a very satisfactory demand for these blocks. Taking all branches of their trade, the company report a very encouraging outlook for business. They are now melting more iron in their foundry than at any time previously. A new catalogue of their specialties has just been completed and will shortly be distributed.

A subscription has been circulated in the First Ward, Syracuse, N. Y., for the purchase of a site for the Ranton Boiler Company. The plot of ground selected is on Free street, and is 120 x 150 feet. Enough money has already been subscribed to guarantee the purchase of a lot; and if the company decide to accept, the erection of a building 80 x 120 feet will soon be begun. The works will give employment to about 50 men, and probably the old employees of the Porter Mfg. Company will be hired. The Ranton boiler had been manufactured at the Porter Works, but since they have been closed have been made at the Phoenix Foundry. The company will in all probability accept the site and build a plant.

The Board of Trade of Massillon, Ohio, are in negotiation with a large concern manufacturing pulley clutches at Hornellsville, N. Y., relative to the removal of the plant from that place to Massillon. The matter has not been closed as yet, but is expected to be definitely settled some time during this month.

The contracts for three new engines at the Ridgewood pumping station on the line of the Brooklyn water supply conduits have been awarded. That for one engine and boilers was given to the Henry R. Worthington Company at their bid of \$199,800; the other two were awarded to M. F. Davidson, his bid being \$84,350. The contract for an engine at the Underhill avenue station was also awarded to Mr. Davidson, the cost to be \$22,750.

The Lansing B. Warner pulley manufactory will open for business very shortly at Milwaukee, Wis.

It is stated that a plant costing \$30,000 will be erected at Birmingham, Ala., by M. A. Castor and associates for the manufacture of steam boilers, &c.

On Sunday, the 12th inst., the foundry of Sterrett & Thomas at Thirty-second and Smallman streets, Pittsburgh, was totally destroyed by fire, causing a loss of about \$50,000, partly covered by insurance. In addition to the above loss a number of valuable structures belonging to concerns for whom Sterrett & Thomas did work were also destroyed. It is thought the foundry will be rebuilt at its present location and on a larger scale.

During the month of January Wm. Tod & Co. of Youngstown, Ohio, shipped 36 carloads of machinery to various parts of the country. Two pieces, weighing 40 tons each, required the special gun cars of the Pennsylvania Railroad for their transportation.

Miscellaneous.

The Stineman Coal & Coke Company of Cambria County, Pa., were granted a charter on the 8th inst., with a capital stock of \$50,000. The directors are Jacob C. Stineman, Washington I. Stineman, South Fork; Robert B. Baker, New York; George G. Bradley, New Haven; Robert Hare Powell, Wayne.

At a meeting of stockholders of the New York & Cleveland Gas Coal Company of Pittsburgh, held in that city last week, the following board of directors was elected: W. P. DeArmit, W. H. Berger, Henry Phipps, Frank Semple, John Walker, J. J. Donnell, J. T. Hamilton, J. D. Lyon and F. M. Carnegie.

The Wisconsin Bridge Company are removing their works from Wauwatosa to North Milwaukee. The new plant will be entirely of iron except the foundations. Four buildings will be erected, which will cover one entire block, or 300 x 300 feet. It is expected that the plant will be completed by May 1.

The Flickinger Wheel Company of Galion, Ohio, have increased their capital stock from \$50,000 to \$100,000, and will double their capacity, building three four-story structures, in addition to the present plant.

A company has been organized in New Castle, with a capital stock of \$10,000, for the manufacture of steel novelties. J. C. Reed and C. Watson of that place have been elected president and secretary respectively.

The new factory of the E. C. Morris Safe Company, at Hyde Park, Mass., will cover about 53,000 square feet of floor surface and cost over \$50,000.

The new shops of the Great Northern Railroad, at Spokane, Wash., will be completed and ready for operation by September next. The entire structure, including machinery, will cost about \$125,000.

The Huntingdon Car & Wheel Works, at Huntingdon, Penn., were sold by the sheriff on the 10th inst., under foreclosure proceedings, and were bought in by the bondholders secured by the mortgage.

The Gould Coupler Company's shops, at Depew, N. Y., will hardly be ready for use before the early spring. The works at Black Rock were found too small for the ever-increasing business of the company, and the couplers are being made at other shops temporarily. The new buildings are ready for the trusses, which are now being put in place. The annealing

house of the company, at Depew, suffered from high winds recently. The gable end of the house was blown down, causing a delay of about three weeks in the work. The windows of the locomotive works were blown in, and considerable damage was done to the other buildings.

Among recently authorized corporations in Illinois are the following: McAleenan & Co., at Peoria, capital stock, \$15,000; for the manufacture of boilers and sheet-iron work; incorporators, William J. McAleenan, Eugene McAleenan and Maggie A. McAleenan. The Cushman Telephone Syndicate, at Chicago; capital stock, \$1,000,000; for the manufacture of telephones and switchboards and to construct telephone exchanges; incorporators, H. L. Hollister, Israel M. Hay, J. S. Given and John D. Cameron. The Havana Metal Wheel Company, Havana; to manufacture metal wheels; capital stock, \$25,000; incorporators, Harvey J. Phelps, Lewis E. Waterman and Orlando B. Thoop. The North Side Electric Street Railway Company, at Chicago; capital stock, \$500,000; for the construction and maintenance of a system of street railways in Chicago; incorporators, August Rieke, F. W. McNally and William Kilpatrick. The Augusta Electric Light & Mfg. Company, at Augusta, Hancock County; capital stock, \$16,000; to furnish light and power for the manufacture of brick, tile and pottery; incorporators, William Gelm, B. C. Crain, D. P. Coffman, R. J. Crigson and O. L. Pitney. The Babcock Fire Extinguisher Company, at Chicago; capital stock, \$100,000; for the manufacture of fire-extinguishing apparatus and appliances; incorporators, William C. Stoddard, William Wilkinson and Alfred Holman. The Bennars Hubless Adjustable Self-Oiling Carriage Mfg. Company, at Chicago; capital stock, \$200,000; for the manufacture of carriages; incorporators, William Bennars, Hector A. Bennars and Albert Jacobs. The Allan Maxwell Mfg. Company, at Chicago; capital stock, \$300,000; for the manufacture of chilled gear wheels and electrical supplies; incorporators, J. G. Hambrick, R. R. Kerr and D. G. Laxson. The Henry Knapheide Wagon Company, at Quincy; capital stock, \$20,000; for the manufacture of wagons and vehicles; incorporators, H. E. Knapheide, M. C. K. Germann and A. M. Knapheide. Chicago Carpet Sweeper Company, Chicago; capital stock, \$50,000; incorporators, James Rosenthal, Herbert Till and Louis Hening. The Kaplar Patent Tinware Mfg. Company, Chicago; capital stock, \$20,000; incorporators, Harris Kaplar, Jacob Burkhardt and others. The Breitling Metal Ware Mfg. Company, at Chicago; capital stock, \$75,000; for the manufacture of metal ware; incorporators, Charles Breitling, Gustav Steiglitz and Adolph Hartman. The Smith-Hill Foundry & Machine Company of Quincy, Ill., have increased their capital stock from \$75,000 to \$100,000.

The Pittsburgh Reduction Company of Pittsburgh, manufacturers of aluminum, whose works are located at Kensington, Pa., will shortly commence to make extensive improvements and additions to their plant, which will very largely increase their capacity for the manufacture of aluminum. It is said that upward of \$150,000 will be expended for this purpose.

At a meeting of the stockholders of the Bostwick Fire Proof Steel Lathing Company held at Wheeling, West Va., last week, the following board of directors was elected: J. A. Miller, E. C. Myers, H. B. Baguley, W. D. Johnson and William Ellingham. A partial organization was effected by the selection of J. A. Miller for president. A meeting will be held some time in the latter part of this week for the purpose of finishing the selection of officers and taking steps to push the business more actively than ever before.

The formation of a new company at Niagara Falls, N. Y., is announced, to be known as the Hausmann Art-Metal Works, and to take in the Carter Company of Niagara Falls and the Rodwell Mfg. Company of Buffalo. The capital stock will be \$150,000. Power will be furnished by the Niagara Falls Power Company.

The Union Car Company of Lancaster, with a capital of \$400,000, have been incorporated at Albany, for the purpose of manufacturing cars, car wheels, trucks, &c., at Depew, the new suburb of Buffalo.

The Milwaukee Harvester Company, Milwaukee, Wis., have increased their capital stock from \$750,000 to \$1,000,000. It is the intention of the company to enlarge their facilities.

The personal property of the Erie Car Works at Erie, Pa., has been sold by the sheriff for \$20,600.

It is stated that a plant for the construction of railway cars will be erected at Jackson, Tenn., by R. S. Fletcher. A factory for the manufacture of hoisting machinery, windlasses, &c., will be established at Chattanooga, Tenn., by George A. Shaaf and associates.

TRADE REPORT.

Interest centers chiefly in the Steel Rail market at the present time. Eastern mills record sales aggregating not less than 75,000 tons, and it is known that the two great Western mills have taken a number of important orders lately, the details of which are being withheld. On the whole it may be stated, however, that relatively the Eastern works have done better, having booked about 225,000 tons out of an estimated total of 375,000 to 400,000 tons, the Colorado mill being cut down at 40,000 tons. Nearly all of this tonnage is for renewals.

Compared with some of the palmy years of the Rail trade, this is not a brilliant record and its magnitude is not such as to induce the great leading Western Steel companies to cover their requirements of Lake Ore at once.

Nothing of consequence has been done yet in the Cleveland Ore market, which seems to be chiefly exercised over the vessel freights during the coming season.

The recent upward movement in Bessemer Pig in Pittsburgh finds its explanation in the fact that owing to trouble with some of the furnaces of the larger plants, some concerns which at times are sellers have been buyers lately. This would point to only a temporary condition of affairs.

Soft Steel Billets have had a somewhat agitated market in Pittsburgh for a few days, but matters seem to have quieted down at the level of \$21.60 @ \$21.75.

In Foundry and Forge Irons Chicago continues to report a good deal of activity, the characteristic feature remaining, however, that the local furnaces are capturing the bulk of what large business there is going. Cincinnati, which may be called the focal market for Southern Iron, still shows little activity, although an easier feeling prevails. Eastern markets continue dull, with indications that a somewhat despondent feeling is gaining ground.

Contrary to expectations, Eastern mills have carried off 21,500 tons net of the total of 26,500 tons of the great Cramp order. Other good contracts for Pipe lines are in the market. Chicago reports the lowest prices on record in this line.

Some good Cast-Iron Pipe contracts have been taken, but at low prices. Thus the Springfield, Mass., order was secured at about 1.15¢ per pound.

Bars are active in the West, but are still in a depressed condition in the territory east of the Allegheny Mountains.

The latest copper statistics show a somewhat declining production. The consumption of wire for electrical purposes is referred to as unprecedented.

Lead has been creeping upward and the prediction is being made that some of the Lead now being refined in bond will soon remain here at least in part.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 50 Dearborn street,
CHICAGO, February 15, 1893.

The condition of the weather is now a little more favorable to business. The railroads are moving freight more promptly, owing to the gradual disappearance of snow and ice. It will take two or three weeks, however, to enable them to catch up with accumulated traffic and to keep matters in the usual satisfactory shape. Everything is looking better in both raw material and finished products, with the single exception of Plates. The volume of trade, taking the whole line of Iron and Steel products, was larger last week than any other week thus far this year, with a distinct tendency to firmness in prices.

Pig Iron.—Local Coke continues very active, and numerous sales are reported of good sized lots ranging from 500 to 1500 tons for scattered deliveries. The two weeks just ended make in themselves a very satisfactory month's business, if sales were to stop completely. More orders are in sight, however, some of which will undoubtedly be closed soon. The activity is ascribed to the increased belief among consumers that prices are as low now as they are likely to be during, at least, the first half of the year. Quite a number of the largest buyers had been figuring on their contracts since about the first of the year and endeavored to push prices down lower, but find that bottom has evidently been reached. An encouraging feature of the situation is that considerable tonnage was entered at prices above the minimum recently current. Plenty of inquiries are reported for Southern Coke, but prices are too high as yet for much business in that line. The disparity between the selling price of Northern and Southern Iron is too great to enable much of the latter to be sold. The leading companies are still holding prices firmly, but smaller concerns are taking about all the business now doing in Southern Coke at rates which are shown in our minimum quotations. Lake Superior Charcoal has not been in much demand, but one transaction is noted of a round lot at a good price. While new orders are not numerous, yet consumers are taking more Charcoal Iron than they had anticipated, and many of them are increasing their old contracts from 25 to 30 per cent. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal	\$16.50 @ \$17.00
Local Coke Foundry, No. 1	13.25 @ 13.75
Local Coke Foundry, No. 2	12.75 @ 13.25
Local Coke Foundry, No. 3	12.50 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners	16.25 @ 17.00
Southern Coke, No. 2	13.35 @ 13.60
Southern Coke, No. 3	12.85 @ 13.10
Southern, No. 1, Soft	13.35 @ 13.60
Southern, No. 2, Soft	12.85 @ 13.10
Southern Gray Forge	12.00 @ 12.90
Southern Notched	12.50 @ 12.75
Tennessee Charcoal, No. 1	16.50 @ 17.50
Alabama Car Wheel	18.35 @ 19.85
Coke Bessemer	14.00 @ 14.50
Hocking Valley, No. 1	17.00 @ 17.50
Jackson County Silver	17.00 @ 17.50

Bars.—The manufacturers have had an extremely good week. Transactions have been numerous, and in some instances buyers have taken lots of 500 to 1000 tons. It is not unusual now to hear of mills unable to quote on anything like prompt shipment and refusing to promise deliveries before the middle of March or some time in April. The demand latterly has been of a more general nature, car orders being scarce. The agricultural implement people are buying quite freely in order to piece out their requirements for the season, while other classes of consumers seem to be equally desirous of securing more stock. Under the circumstances prices are considerably stronger than they were, and, while some mills still quote 1.55¢, half

extras, Chicago, others are talking 1.80¢, and believe that in a short time they will be able to get it. Soft Steel Bars are in good demand, as consumers are increasing their purchases, the contracts which are now being placed usually calling for both Iron and Steel, often containing an option for either party to give or take up to a certain percentage of Steel. The displacement of Iron by Steel is advancing more rapidly than ever before. Quotations on mill lots of Soft Steel Bars range from 1.65¢, Chicago, up, according to the character of the material and the standing of the mill offering it. Store prices are continued at 1.70¢ @ 1.80¢ for Bar Iron and 1.80¢ @ 1.90¢ for Soft Steel, but the latter prices are shaded on desirable orders.

Structural Material.—The good demand for small lots of Beams continues. Large deals are still in sight, but contractors are slow to close, expecting that manufacturers will in time compete more vigorously for business. Mill orders, Chicago delivery, are quoted as follows: Beams, 2¢ @ 2.10¢; Angles and Universal Plates, 1.85¢ @ 1.95¢.

Plates.—Some good contracts have been placed since our last report. One of these involved about 700 tons for the construction of shutes for the new Ore dock to be built at Duluth. Several other contracts of considerable importance were also taken, but all at extremely low prices, the rumor being current that a point was reached lower than anything previously touched in this market. The store trade has hardly been as heavy as during the previous week. Quotations on mill shipment, Chicago delivery, are as follows, for carload lots: Tank Steel, 1.90¢ @ 2¢; Sheet Steel, 2.10¢ @ 2.15¢; Flange Steel, 2.27¢ @ 2.30¢; Ordinary Fire Box, 3.50¢. Store prices continue as follows: No. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.25¢ @ 2.40¢; Sheet, 2.40¢ @ 2.60¢; Flange Steel, 2.70¢ @ 2.90¢. Tubes are quoted at 60 % off, with concessions on desirable orders.

Sheets.—Manufacturing consumers are buying Black Sheets to some extent, but most of the large concerns have now covered their requirements pretty well into the year. As the season for jobbers' contracts will not develop until some time in the spring, the prospects favor a comparatively dull period for some time. The mills, however, are reported to be in good condition now and prices are maintained quite firmly on the basis of 2.85¢, Chicago, for No. 27 Common and 2.90¢ @ 3¢ for Steel. Galvanized Iron is moving along placidly, with some prospect of activity, which depends, however, on the weather. Should mild weather continue, outdoor work will soon be vigorously prosecuted. Prices remain on a basis of 70 and 10 % off for Juniata, mill shipment, but jobbers are a little weaker and are now selling at 70 and 2½ %. Sheet Copper is quiet, being influenced by the same state of affairs as Galvanized Iron, but prices continue at 30 % discount for small lots.

Merchant Steel.—The standard makes of Open-Hearth Machinery and Spring Steel keep up to old rates, the demand being sufficient to keep the mills well employed together with orders already booked. The inquiry is fully equal to that of last February, so that trade to-day is in at least as good condition as then. The Gautier Steel Department of the Cambrian Iron Company report that their tonnage shipped into the Northwest of Merchant Steel alone during the month of January was the largest in their history. Quotations are continued at 2¢ @ 2.20¢, Chicago, for mill shipments of Machinery and Spring Steel, while ordinary Tool Steel is firmly held at 6¢ @ 7¢, according to quantity.

Rails and Track Supplies.—A great deal of Steel Rail tonnage has been entered recently from the leading Western roads and the local manufacturers now feel that they are comfortably fixed so far as their largest mill is concerned. Prices continue at \$30 @ \$32, according to quantity. Iron and Steel Splice Bars are unchanged at 1.65¢ @ 1.75¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.70¢; Spikes, 2¢ @ 2.05¢.

Old Rails and Wheels.—Transactions in Old Iron Rails are reported at about \$18.50, Chicago. A little more movement has taken place recently toward the Mahoning Valley, but not enough to impart any great degree of activity to this branch of trade. Consumers are advised that large quantities of Rails will be offered in this market in March from the Southwest, and are therefore looking for lower prices by that time. Old Steel Rails are quiet, with short pieces quoted at \$11.50 and long lengths, \$14.50 @ \$15. Old Car Wheels are firm at \$14.75.

Scrap.—Business is now moving along with something of its old-time volume, although the stock of all kinds of material held here is too great as yet to be affected to much extent by the improved demand. Dealers make the following quotations per net ton: No. 1 Forge, \$15.50; No. 1 Mill, \$11; Pipes and Flues, \$10; Axles, \$25; Horseshoes, \$16; Fish Plates, \$18; Spikes and Bolts, \$15; Cast Borings, \$6; Wrought Turnings, \$8.25; Axle Turnings, \$10.50; Heavy Cast, \$11.25; Stove Plate, \$8.50; Malleable Cast, \$10; Mixed Steel, \$10, gross ton; Coil Steel, \$14; Leaf Steel, \$17.75. The demand for Leaf Steel is now unusually heavy, dealers reporting that large lots are wanted by consumers.

Metals.—Copper is unchanged at 12½¢ for carload lots of Lake and 11½¢ for casting brands. Spelter continues at 4.20¢ for carload lots of prime Western. In Pig Lead this market has been much firmer at 3.75¢ @ 3.80¢, with sales of some 200 tons at 3.75¢. Brokers report a growing inquiry, but say there is no anxiety on part of consumers as to the future.

Freight Rates.—Freight rates to Chicago on carload lots of Iron and Steel from principal outside sources of supply:

Pig Iron.

	Ton.
Birmingham, Ala.	\$3.85
Chattanooga, Tenn.	3.60
South Pittsburg	3.47
Cowan	3.23
Ashland, Wis.	2.75
Mahoning Valley, Ohio	2.00
Southern Ohio	2.00
Western Wisconsin	1.50
Central Wisconsin	1.15

Finished Iron and Steel, Nails, Barb Wire, &c.

	100 pounds.
Eastern Pennsylvania	.028
Superior, Wis.	.22
Pittsburgh, Pa.	.17½
Ohio River points	.17½
Youngstown, Ohio	.15
Cleveland, Ohio	.14
Canal Dover, Ohio	.14
Toledo and Findlay, Ohio	.12
Muskegon, Mich.	.11
Muncie, Ind.	.11
Peoria, Ill.	.08
Springfield, Ill.	.05

H. L. Green & Co., manufacturers' agents for the sale of Iron and Steel, removed their offices, on the 1st inst., to the Ogden Building, southwest corner of Lake and Clark streets, Chicago, two blocks west of their former location.

Within a short time a patent coke drawer will be tried by the H. C. Frick Company at their Valley Works in the Connellsville region. With this machine,

it is claimed, a laborer and a boy can draw 30 ovens every 24 hours. It is stated that if the new machine proves satisfactory it will be adopted by the H. C. Frick Coke Company and other large coke manufacturers in the Connellsville region.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., February 14, 1893.

A week of considerable activity may be noted, but it has left no distinct impression of improvement in the situation. There is no scarcity of business, in one sense of the word, yet it is being competed for as though every order was to be the very last chance and each one was determined to secure it. Demoralization in prices is the natural result, and to-day, with the possible exception of Steel Billets and Steel Rails, there is not an article on the list but can be bought at the lowest figures ever recorded. Unquestionably the cost of production is also very low, but it is the universal testimony that there is no money in the business, and that some concerns must be working at a positive loss. Under such conditions as these it is impossible to give a very cheerful report, although the volume of business ought to be sufficient to put matters in excellent shape. Some very important and long-pending contracts have been closed during the past few days, but at prices which are not likely to be made public, but it is perfectly safe to assume that they are below anything hitherto recorded. The Cramp Ship Building Company's order was placed as follows :

	Tons.
Wellman Iron & Steel Company, two bulls and two sets boilers	9,000
Paxton Rolling Mill, two bulls	8,000
Carnegie, Phipps & Co, one hull	4,000
Carbon Steel Company, three sets boilers	1,000
Phoenix Iron Company, shapes	2,500
Pottsville Iron & Steel Company	2,000

26,500

The Rochester order for 8000 tons of Light Steel Plates was also closed last Friday; all taken by Carnegie, Phipps & Co. These, with the material for two Government cruisers taken the last week in January, aggregate alone nearly 50,000 tons of Plates and Shapes, yet prices are as weak as ever and new business just as eagerly sought for. Among recent inquiries is one for Light Steel Plates for a system of water works in Oregon. It is said that it will result in business in the very near future, and will call for 5000 to 10,000 tons, and will, perhaps, give additional impetus in the direction of greater activity. The 4000 tons rails mentioned last week as sold for export to Cuba was preceded by orders from London to the Alan Wood Company for their Locomotive Jacket Iron. Several shipments have been made, and it is pretty clear that these Sheets are taking the place of Russian Planished Iron for locomotive jacketing in Europe.

Pig Iron.—There has been a good deal of business done, but again we are under the necessity of saying, without improvement in prices. Indeed, the trade have settled down to the conviction that there is not likely to be any improvement until some decided increase in demand is met with, and as most people are already working on a larger scale than usual it is hard to see at which point to look for improvement. The Rail mills and the Pipe mills and the car shops could do more, and if there is to be any distinct forward movement it will probably come from these sources, and while there is a better feeling in Rails there is not enough in it to warrant great expectations in regard to the immediate future. General consumption is very large, however, and, judging from

the latest reports in regard to production and stocks on hand, the statistical position is decidedly encouraging, and with a continuance of favorable developments during the next few weeks prices ought to be influenced accordingly. Meanwhile the demand for standard brands is about equal to the supply, so that prices of such show no change whatever, while there is more or less irregularity in most other descriptions. Sales have been at all sorts of prices within the limits given herewith, varying according to quantity, brand, delivery, &c. The range for Philadelphia (or equivalent) is as follows, and for some Southern brands 25¢ @ 40¢ less at Harrisburg and intermediate points to Baltimore:

American Scotch, No. 1X.....	\$17.00	@	\$17.25
American Scotch, No. 2X.....	16.00	@	16.25
Standard Penna. (Lake Ore), No. 1X.....	14.75	@	15.25
Standard Penna. (Lake Ore), No. 2X.....	14.25	@	14.50
Standard Virginia, No. 1X.....	14.75	@	15.00
Standard Virginia, No. 2X.....	14.00	@	14.25
Virginia and Southern, No. 1X.....	14.00	@	14.50
Virginia and Southern, No. 2X.....	13.25	@	13.50
Standard Penna. and Virginia Forge.....	13.00	@	13.25
Ordinary Forge.....	12.50	@	12.75

Steel Billets.—Business is not active; consumers having covered for their early requirements, are not in the market at the figures now asked. Recent transactions were on the basis of \$23.50, Schuylkill Valley, for Western Billets in 1000-ton lots, but as \$23.75 @ \$24 is quoted on additional lots, there is not much disposition to do business at the advanced rates. Eastern Billets are quoted nearly \$1 above these figures, and, as there is an active demand for small lots, quick delivery and for special qualities, there is no difficulty in securing full employment at prices in proportion.

Steel Rails.—Some good-sized lots have been taken and, apart from the demand for Heavy Rails, there is quite a large business in other directions. Street Rails are in active demand, one of the Philadelphia roads having taken 3500 tons 64 lb Rails, with a still larger quantity to be taken during the summer months. The extension of the trolley system to outlying towns in all parts of the country will materially increase the demand for Rails, so that even if there is no especial increase from the regular sources, the Rail mills are pretty sure to have a larger business than during the past two or three years. Rumors of a reduction in the price are emphatically denied, quotations being uniformly firm at \$29 at mill for Heavy Rails, at which figure the New York Central have placed an order for 40,000 tons with the Lackawanna Company.

Muck Bars.—No demand of any account. There are sellers at \$23.75 @ \$24, delivered, but buyers make no response.

Bessemer and Low Phosphorus Pig.—Market dull and heavy, with sellers at \$15.50 and \$17.25 @ \$17.50, f.o.b. cars furnace. No sales of any account can be reported.

Bars.—There is a pretty good demand for Bars in small lots, but prices are weak and hard to maintain at 1.65¢ @ 1.70¢ for best Refined Iron, while what some call "good Iron" can be had for very little over 1½¢ lb. Under such conditions we can only say that the feeling is anything but cheerful, and in the meantime gives little promise of early improvement. Steel Bars command from the same price as Iron, to 2½¢ or 3½¢ more, according to what the requirements as to quality may be, but ordinary Soft Steel can be had for 1.70¢ @ 1.75¢.

Skelp.—Fair demand, with several sales this week at about 1.55¢, delivered.

Plates.—The recent large orders from the shipyards have been mentioned in a

previous paragraph; but, apart from these, there is a good general demand. Mills are in a position to handle a great deal of immediate business, however, so that prices show no improvement, owing to sharp competition for anything of that kind that is offered in fair sized lots. Of course, there is a great deal more work under contract, but very little of it is for early delivery, so that for all practical purposes the situation is not materially changed. General quotations are about as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.90¢	1.80 @ 1.85¢
Shell.....	2.00	2.10¢
Flange.....	2.70 @ 2.90¢	2.30 @ 2.40¢
Fire Box.....	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities.....	3.25	3.75¢

Structural Material.—Mills engaged on this class of work are tolerably well employed, and while prices are low there is plenty of work, and to that extent the situation is satisfactory. There is also quite an encouraging prospect for additional business, and on the whole the indications favor the idea of unusual activity during the summer months. Prices unchanged as follows: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.85¢ @ 1.95¢; Universal Plates, 1.9¢ @ 1.95¢

Sheets.—There is a good demand for Sheets, and although prices are low, there appears to be a disposition to hold firm at the figures now quoted, which for best makes are about as follows:

Best Refined, Nos. 14 to 20.....	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....	3.15¢ @ 3.20¢
Best Refined, No. 27.....	3.30¢ @ 3.40¢
Best Refined, No. 28.....	3.40¢ @ 3.50¢
Common, $\frac{1}{2}$ ¢ less than the above.	

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about $\frac{1}{2}$ ¢ lower than are here named:

Best Soft Steel, Nos. 14 to 16.....	2 $\frac{1}{2}$ ¢ @ 2 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 18 to 20.....	3¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 21 to 24.....	3 $\frac{1}{2}$ ¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 25 to 26.....	3 $\frac{1}{2}$ ¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 27 to 28.....	3 $\frac{1}{2}$ ¢ @ 4¢
Best Bloom Sheets, $\frac{1}{2}$ ¢ extra over the above prices.	
Best Bloom, Galvanized, discount....	70 and 5%

Old Material.—The demand averages about the same as for some time past, and without any particular change in prices, although the general tendency is toward greater steadiness. Sales at figures about as follows, varying according to quality, point of delivery, &c.: Old Iron Rails, \$19 @ \$19.50, delivered; Old Street Rails, \$20 @ \$20.50; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$18 @ \$16.50, Philadelphia, or for deliveries at mills in the interior, \$16 @ \$17, according to distance and quality; \$8 @ \$9 for No. 2 Light; \$11 @ \$12 for Machinery Scrap; \$11.75 @ \$12.25 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Wrought-Iron Pipe.—It is hardly worth while quoting a list of discounts, as no one pretends to do more than come within 5 or 10% of them. The trade is very much demoralized, and quotations are largely according to size of order, delivery, &c. Nominal discounts as follows: Butt, Black, 57 $\frac{1}{2}$ %; Butt, Galvanized, 50%; Lap, Black, 67 $\frac{1}{2}$ %; Lap, Galvanized, 57 $\frac{1}{2}$ %; Boiler Tubes, 67 $\frac{1}{2}$ %, all sizes, new list; Casing, 62 $\frac{1}{2}$ %, new list.

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date of February 18, 1893, write: The week just closed has been uneventful as far as actual placing of any large lots of metal is concerned. The few transactions, however, developed the fact that the market is still rather in favor of

the buyer. Particularly may this be said of Coke-made Irons. There seems to be a decided tendency on the part of Northern furnaces to meet any competition that may come from the South, and their metal is slightly favored by many foundries, where it can be used to greater advantage with a cheap soft grade of Southern Iron.

There is now quite a broad inquiry for Lake Superior Charcoal coming from the various sections of the country, which seems to indicate that the Iron delivered to consumers last fall prior to the close of navigation is not holding out in quantity as well as was expected. From statistics, and judging also from the present demand and number of furnaces out of blast and that will continue so in this section of the country, we should say without hesitation that Lake Superior Charcoal Iron is in better position to-day than any of the other grades of metal. If the demand continues, and it seems likely that it will, there cannot fail to be an advance on this Iron.

The market is steady and quotations to-day as follows:

Lake Superior Charcoal, all numbers.....	\$16.50 @ \$17.00
Lake Superior Coke, Bessemer.....	15.00 @ 15.50
Lake Superior Coke, Foundry, all ore.....	16.25 @ 16.75
Standard Ohio Blackband (40 per cent.).....	16.00 @ 16.50
Southern No. 1.....	14.50 @ 15.00
Southern Gray Forge.....	12.50 @ 13.00
Jackson County (Ohio) Silver.....	17.50 @ 18.00

Baltimore.

BALTIMORE, February 14, 1893.

The same unsettled condition of the market, the same hopes for better prices, the same disappointments characterized the market here for the past week as for some time past. Machinery Steel shows the greatest improvement and an advance, which, however, will be slight, will likely occur should the demand hold out for another week. Tire Steel has been moving quite briskly on account of the placing of some good-sized orders by carriage builders. In Plates there is nothing new and little being done.

Bars.—Both Iron and Steel Bars are at their bottom prices and there is abundant evidence that the mills will soon compel dealers to advance their prices. Quotations are same as last week: From stock, 1.90¢ @ 2¢; from mill, 1.80¢.

Plates.—Little is being done in this line and inquiries are very scarce. Prices are so low, though, that no change can be made in our quotations in that direction and the market most certainly does not warrant an advance. Tank Iron and Steel, 1.85¢ @ 1.95¢; Shell Steel, 2.20¢ @ 2.25¢; Flange Steel, 2.40¢ @ 2.45¢; Fire Box Steel, 2.55¢ @ 2.60¢; Marine Steel, 2.55¢ @ 2.60¢.

Merchant Steel.—As stated above, quite a pleasant increase in demand is noted here, and we hope to have next week the rare privilege of noting an advance in our next report. Tire Steel and Cold Drawn Shafting has been moving with some freedom. On the whole the outlook is fair. Machinery Steel, 2.15¢ @ 2.30¢; Tire Steel, 2.15¢ @ 2.25¢; Toe Calk, 2.35¢ @ 2.45¢; Spring Steel, 2.50¢ @ 2.60¢.

Light Sheets.—From stock the quotations ruling now are, No. 8, 2.40¢; Nos. 10 to 14, 2.45¢; Nos. 15 and 16, 2.60¢; Nos. 17 and 18, 2.90¢; Nos. 20 and 22, 3.05¢; Nos. 23 and 24, 3.25¢; Nos. 25 and 26, 3.55¢; No. 27, 3.70¢; No. 28, 3.85¢.

Tubes and Pipe.—The market has been holding its own in this respect and that is the most favorable thing that can be said in view of the demoralization noted in our last report. Boiler Tubes from stock, 60

off for 2 inches; 65 off for 3 inches. Mill shipments 5% additional discount.

W. N. Wyeth's Sons, 100 South Charles street, announce that they have accepted the agency for the Anchor Boiler Rivet and will carry full line of same in their warehouse.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, February 15, 1893.

There continues to be an easy feeling in the market for Pig Iron, and while there is a fair demand for current or short forward consumption, there is no disposition shown to buy large blocks of Iron for long time delivery, nor would the furnaces entertain them at present prices. The purchases have been mainly 500 to 1000 tons, and for this month's and March and April delivery, with smaller lots running down to one carload, but in the aggregate they make a fair volume of business. There is some inquiry for Lake Superior Charcoal Iron, but Southern Charcoal Irons are quiet. No. 2 Foundry has sold as low as \$9.25, f.o.b.; Bessemer and Gray Forge at \$8.25. The advance in Bessemer Iron in Pittsburgh seems to have had little if any effect in this district. Preliminary reports of stocks in the South indicate a small reduction, but there are well authenticated reports that some furnaces have quite an accumulation of Iron which they are anxious to sell. There are applications to have deliveries hastened on existing contracts and other indications that consumption is active and of large volume. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$18.25 @ \$18.50
Southern Coke, No. 2.....	12.00 @ 12.25
Southern Coke, No. 3.....	11.50 @ 11.75
Ohio Soft Stone Coal, No. 1.....	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2.....	15.00 @ 15.25
Mahoning and Shenango Valley.....	15.25 @ 16.25
Hanging Rock Charcoal, No. 1.....	19.00 @ 19.25
Hanging Rock Charcoal, No. 2.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 1.....	15.50 @ 15.75
Tennessee and Alabama Charcoal, No. 2.....	14.50 @ 4.75

Forge.

Gray Forge.....	11.00 @ 11.25
Mottled Neutral Coke.....	10.75 @ 11.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	18.00 @ 19.00
Lake Superior Car Wheel and Malleable.....	17.75 @ 18.00

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, February 14, 1893.

The past week has been one of comparative activity, especially as regards Bessemer Pig and Steel, considerable quantities of both materials changing hands, and at prices somewhat higher than could have been obtained two weeks ago. The Carnegie concern and the Carbon Steel Company have secured a share of the Cramp order for Plates and some business has also been done in Rails. A good many contracts have recently been placed for Wire Nails and the indications are that we will have a very heavy demand for Wire this year. On account of the low prices ruling for Structural Material, it is expected that the consumption will very materially increase and be much heavier this year than in any previous year. All in all, the outlook for a satisfactory volume of business in the principal articles of Iron and Steel manufacture is very encouraging. It is the general impression, however, that prices will continue to rule largely in buyers' favor, although on some lines, on which prices are very close to cost of production, it is not improbable that an improvement will take place.

Pig Iron.—There was more activity in the market last week than has been witnessed in any one previous week for a long time. A remarkable feature of the week was that there were more buyers of Pig Iron than sellers. This is a remarkable statement to make, but it is true. Bessemer Iron for prompt shipment was urgently sought for by buyers, and in some cases without success, even when offers of \$13.50, Pittsburgh, were made to secure the Iron. The present scarcity of prompt Bessemer was brought about principally by the fact that the output of the largest producers in this region was considerably curtailed by the idleness of some of their stacks. Two other large Steel-making concerns were using more metal than they were producing, which made it necessary for them to go in and buy, and the same is true of one or two of the Wheeling concerns. The withdrawal of these three or four concerns from the market as sellers and their appearance as buyers naturally caused a drain on the supply, and for a time Bessemer Pig for early shipment was hard to obtain and commanded good prices. It is probable, however, that the supply will be considerably increased very soon, as two idle stacks in the Pittsburgh district and several in the Wheeling district will be making Iron before this month is out. Gray Forge, too, has felt the influence at work in the Bessemer market and all orders below \$12.25, Pittsburgh, have been withdrawn and in several cases \$12.50 has been asked, but was declined by buyers. We quote as follows:

Neutral Gray Forge.....	\$12.25 @ \$12.35, cash.
All-Ore Mill.	12.50 @
No. 1 Foundry.....	12.75 @ 14.00,
No. 2 Foundry.....	12.75 @ 13.00,
Charcoal Foundry No. 1.....	17.00 @ 18.00,
Charcoal Foundry No. 2.....	16.50 @ 17.00,
Bessemer Pig.....	13.40 @ 13.00,

We note a sale of 8000 tons of Bessemer for next three months' delivery made by a Cleveland concern to a Pittsburgh consumer at a price said to be \$13.40, the Iron netting the furnace \$12.80; also 3000 tons at \$13.45 with a 20¢ freight rate, the Iron netting the furnace \$13.25; also 500 tons for prompt shipment on a basis of \$13.50, Pittsburgh, and one of 800 tons at same price; 1000 tons of All Ore Gray Forge for next three months' delivery at \$12.50, Pittsburgh, the Iron netting the furnace in the Mahoning Valley \$11.80.

Billets.—The Steel market is in better condition, both as regards demand and prices, than it has been for some little time. Within two weeks the market has scored an advance of about \$1 20¢ ton, with very little material for prompt shipment available. Offers made early this month to deliver Steel in Cleveland at \$22.35, and not accepted by buyers, have been withdrawn, and on the other hand, offers to take Steel for April and May at the above price have been declined by sellers. Within the past week other offers made by buyers, at an advance of at least 50¢ 20¢ ton over previous ones, have also been declined by sellers. The advantages of the market just now are clearly on the side of the makers, and the fact that both Pittsburgh and Wheeling are well fixed with business makes their position doubly secure. Since our report of last week Steel has changed hands at prices ranging from \$21.60 to \$22, at buyer's mill, and it is believed the latter named price could be readily obtained for prompt material. One block of 4000 tons is reported to have been taken by Wheeling for Western shipment. As announced elsewhere, Edgar Thomson is again on Billets, and opinions differ as to what effect this will have on the market.

Ferromanganese.—The demand continues quiet and very little material is changing hands. We continue to quote domestic at \$59 @ \$59.50, f.o.b. cars Pittsburgh. We note two sales of foreign

aggregating 85 tons on a basis of \$59, f.o.b. cars Pittsburgh.

Steel Plates.—A goodly portion of the order for Steel Plates of the Cramp Ship Building Company has been secured by Pittsburgh. The Carnegie concern is reported as having secured the contract for the Plates for the hulls, amounting to about 4800 tons, while the Carbon Steel Company have secured the Boiler Plates, amounting to about 1300 tons, the balance of the order having gone to Eastern concerns. Outside of the above, no specially large orders have been reported, with the exception that the Carnegie concern have secured the contract for the Plates to be used in the new gas holder to be built by the Allegheny Gas Company. While on large lots prices quoted below are probably shaded to some extent, our quotations represent what is being obtained for ordinary run of orders. We quote as follows: Flange, 2¢ @ 2.10¢; Fire Box, 2¢ @ 3.25¢ for ordinary and 3.40¢ @ 3.50¢ for best quality; Tank, 1.70¢ @ 1.75¢; Shell, 1.90¢ @ 2¢.

Steel Rails.—Outside of the order for the Pennsylvania Railroad referred to last week, the Carnegie concern is reported as having secured considerable tonnage from a Western railroad, particulars of which have not been made public. The outlook for the future as regards Steel Rails is more encouraging now than for some time past. As announced elsewhere, Edgar Thomson went on Billets on Sunday night, the 12th inst., but will probably return to Rails before a great while. Prices are unchanged at \$29 at mill for standard sections.

Wire Rods.—Very little is doing, and we are not advised of any transactions in Rods since our report of last week, and we continue to quote \$29.50, Pittsburgh, but, as before stated, desirable business would shade this price to some extent.

Structural Material.—With the exception of a few days, the weather since the first of the year has entirely precluded outside building operations, which, of course, has had an adverse effect on the demand for Structural Material. However, we are advised that a fair volume of business is going, particularly for small-sized Beams and Channels, and reports from architects would indicate that when the building season opens up we may expect a very considerable increase in demand. We quote as follows: Beams and Channels, 1.80¢ @ 1.90¢, f.o.b. cars Pittsburgh; Angles, 1.70¢ @ 1.75¢; Z Bars, 1.90¢ and Tees 2¢ @ 2.10¢.

Muck Bars.—Trade continues very dull and little material is changing hands. We continue to quote at \$24.25, Pittsburgh, for best quality of Bars, and we have not been advised of any sales within the last few days.

Sheets.—In the past week there has been more of a disposition among buyers to talk about season contracts, and it is expected that within a short time a number of these will be closed. Quite a number of mills are refusing to contract for delivery later than June 30, for fear there will be labor troubles this summer which will prevent them from carrying out contracts. Prices are about as given last week, and we continue to quote Ordinary Box Annealed Sheets as follows: No. 24, 2.50¢ @ 2.55¢; No. 26, 2.60¢ @ 2.65¢; No. 27, 2.70¢ @ 2.75¢. For Soft Steel Sheets from 5¢ to 10¢ additional on above prices is obtained. Discounts on Galvanized Sheets, Best Bloom, are unchanged at 70 and 5% @ 70 and 10%, according to order.

Bars.—The improvement in trade noted last week continues, and the situation is probably better just now than at any time this year. Volume of business has increased to some extent, and the ruinously low prices that prevailed during the latter

part of January have been withdrawn in a good many cases. We continue to quote No. 1 City Bars at 1.55¢ @ 1.60¢, and Steel Bars at 1.60¢ @ 1.65¢, half extras. In the Mahoning Valley Bars are held at 1.40¢ @ 1.45¢, half extras, according to order.

Wire and Cut Nails.—Considerable dissatisfaction has been expressed by Western Cut Nail manufacturers over the new card adopted on January 31 last. Last week a meeting of Wheeling and other Western manufacturers was held in the McClure House, Wheeling, in order to get an expression of views regarding the new card, but owing to limited attendance nothing was accomplished, and an adjournment was had to reconvene in Pittsburgh on Wednesday, the 15th inst., at the Monongahela House. At the Pittsburgh meeting it is expected that all Western manufacturers and a number of Eastern manufacturers will be represented, and some important action regarding the new card will doubtless be taken. Those best informed on the situation incline to the belief that the new card does not come up to requirements, and is not practicable. It is the general impression that an attempt will be made to arrange a new card similar to the Wire Nail card, and action looking to this will be taken at the Pittsburgh meeting. The demand for Wire Nails continues good, and prices are firmly maintained on a basis of \$1.40 at Pittsburgh and \$1.42½, Cleveland, in carload lots. A buyer from this district who was in Cleveland recently was unable to secure any concessions over the above established price. A slight increase in demand for Cut Nails is reported, and business in Wheeling mills has picked up considerably of late. Prices are ranging from \$1.42½ to \$1.45 on a 30-cent average, with the latter named as the ruling quotation in carload lots. For large blocks the first-named price would be accepted.

Merchant Steel.—Within the past two or three weeks mills have shown a decided disposition to go out and solicit business, and for this reason some very low prices have been named in order to secure orders. Buyers claim that they have been offered Steel at almost their own terms, and considerably lower than they had any expectation of buying. The market seems to be somewhat demoralized and in its present condition it is impossible to quote prices which will correctly represent what is being obtained in actual transactions.

Freights.—We understand that there will be a reduction in the rates on Pig Iron and Billets from Pittsburgh, Pa., to Eastern points, effective February 21, 1893, and from advices so far received, the figures will be as follows:

To	On
Boston, Mass.....	Pig Iron. Billets.
New York, N. Y.....	\$2.70 3.00
Philadelphia, Pa.....	2.30 2.60
Baltimore, Md.....	1.90 2.20
All per gross ton.	1.70 2.00

Cleveland.

CLEVELAND, OHIO, February 13, 1893.

The situation in the Ore district is unique in every way. There were reports to-day that negotiations were pending for the sale of new Ore. A thorough canvass of the Iron Ore and Pig Iron districts failed to give the rumors any color of truth. It was said that the prices talked of were 50 cents 20¢ ton below last season's rates, which would bring Ashland, Aurora, Norrie and similar Ores down to about \$3.75 @ \$3.90 20¢ ton. Ore dealers say that no thought has been given such prices. Said one of the leading Ore men to-day: "The Mesabi Mine will really not any more than supply the increased de-

mands for Bessemer this year, when you remove from the calculation the mines that have been practically worked out. The feeling in regard to Bessemer Iron is improving day by day, and \$14 $\frac{3}{4}$ ton is probably soon to be realized. There has been talk of cuts amounting to 75¢ $\frac{3}{4}$ ton over last season's prices for Ore. Well, if we are to pay the vesselmen the same as last year and sell our Ores for 75¢ less $\frac{3}{4}$ ton, we may as well begin to make arrangements to go to the infirmary." Buyers certainly seem in no hurry to move. One of them said to-day, and asked that he be quoted in *The Iron Age*: "The vesselmen are claiming that you could not engage Ore tonnage to day at less than \$1 from Escanaba; \$1.25 from Marquette, and \$1.25 from Ashland and Two Harbors. Now, the average mild rate in 1892 was 74¢ from Escanaba; 98¢ from Marquette, and \$1.15 from Ashland and Two Harbors. Let the ice in the lakes move away early in March and the vessel owners will crowd over each other in their efforts to get to the front and secure business." Vesselmen are making a wonderfully bold presentation of their rights. No one stands closer to them, perhaps, than John Mulrooney, editor of the *Marine Review*, who assures *The Iron Age* correspondent that more vessel property has changed hands and at better prices since the close of navigation in the autumn of 1892 than in any one winter in 20 years. He maintains that this illustrates the faith of the vesselmen in the stability of lake freights. Editorially he says:

"As most vessel owners are alert to the conditions surrounding their chances for profit in the business of the coming season, and realize that they now hold the upper hand, the opinion that Ore sales may be delayed into April or May grows more general with each week of inactivity. The transportation interests are also suspicious of a movement to depress the freight market, as shown by some recent negotiations regarding grain freights. The accumulation of grain at Duluth and Superior is practically equal to the utmost elevator capacity at the head of the lakes, and on this account vessel owners were of the opinion some days ago that they could readily secure a freight of 4¢ a bushel for vessels to go to Lake Superior for this grain upon the opening of navigation in the spring. They were surprised, accordingly, upon inquiry among Duluth grain shippers, to receive answer from the shippers to the effect that they held offers for a million bushels of vessel capacity to load shortly after the opening at 3½¢. At first thought this offer of tonnage at what was considered a low rate was charged to the American Steel Barge Company, but a story going the rounds of the lakes during the past few days attributes the proposed grain deal to an effort of one of the big Iron Ore companies to so affect the freight market as to admit of Ore being sold at a reduction on last year's prices. The company charged with this offer to carry Duluth grain is the Minnesota Steamship Company, an adjunct of the Minnesota Iron Company and Illinois Steel Company, and it is said that the plan was to charter their fleet of steel steamers for one or two trips if forced to contract on the offer, and then depend upon the effect produced in lake freights to cover outside tonnage for early trips with Ore. The story indicates the feeling among vessel owners as to freights, and their suspicion of being deprived of the advantage which they now hold, and is given simply for what it is worth."

It can be readily inferred from these interviews that the vesselmen will have something to say about fixing the prices to be paid for the bulk of Ore to be mined in 1893. From, perhaps, the most conservative Iron man in the city this statement was received to-night: "Business

is improving and by the time navigation opens you will see prices for Ore within 25¢ or 35¢ of those prevailing last year."

Iron Ore.—During the week ending at noon to day 28,000 tons of Ore were sent forward to the furnaces, as compared with 27,000 tons for the same week in 1892. The old Ore on the docks is in better demand and many stock piles are being rapidly cut down. Eastern furnace men are making inquiries for Bessemer Ore and they are likely to figure conspicuously in the movements of the market for 1893. Non-Bessemer Ores on the docks are bringing \$8 per ton and are in better demand than for several weeks past.

Pig Iron.—There has been a steady improvement in the Bessemer market during the past week. Sales of Bessemer are reported at figures close to \$13.65 and dealers quote to day \$13.65 @ \$13.80. This is something of an improvement over the very low prices of a week and ten days ago. A local dealer just returned from Pittsburgh claims to have positive assurance that during the decline Bessemer Iron sold for less than \$13 $\frac{3}{4}$ ton. It is now recovering splendidly and seems to be likely to still further improve. It is said that the actual supply of Bessemer would only last 20 days if the supply was to be suddenly cut off, but the production keeps up so well that the wants of buyers are at no time really pressing. Gray Forge is worth \$12.40 @ \$12.50. Cleveland, and No. 1 Foundry is still quoted at \$14. No. 2 at \$13.50 and No. 3 at \$13.

Muck Bar.—Dealers report a slight improvement and give quotations to day as \$24.50 @ \$24.75, with a fair demand.

Scrap.—The market has again relapsed into a condition of extreme dullness. No. 1 Railroad Wrought at \$15 @ \$15.25 $\frac{3}{4}$ net ton is in slight demand. Cast-Iron Borings are quoted at \$7.50 @ \$7.60 $\frac{3}{4}$ gross ton and Wrought-Iron Turnings at \$10 $\frac{3}{4}$ gross ton.

Old Rails.—The market continues weak, with Old Americans quoted nominally at \$19.50 @ \$19.75.

Manufactured Iron.—The outlook is brighter and a fairly liberal amount of Common Bar is being placed at 1.60¢ @ 1.65¢.

Freights.—Ore: Cleveland to Valley Points, 62½¢; Cleveland to Pittsburgh, \$1.05. Pig Iron: Valley Points to Cleveland, 60¢ $\frac{3}{4}$ ton; to Pittsburgh, 60¢, Muck Bar. Blooms, Billets, Scrap, Iron and Steel Rails, Old Wheels, &c.: Valley Points to Cleveland, 70¢ $\frac{3}{4}$ ton; to Pittsburgh, 75¢ $\frac{3}{4}$ ton; to Boston, \$3.50 $\frac{3}{4}$ ton; to New York, \$3.10 $\frac{3}{4}$ ton; to Philadelphia, \$2.70 $\frac{3}{4}$ ton.

Boston.

Office of *The Iron Age*, 146 Franklin St., Boston, February 15, 1893.

Pig Iron.—The demand for Pig Iron in this market continues quiet. Still there is a moderate business doing, from the fact that the foundry people are busy and are using a good volume of Iron. Some of them are using an unusually full quantity, and they must necessarily buy considerable Iron, in order to keep up their supply. But they buy in rather small lots, as a rule. There are still some deliveries going on in Iron bought some time ago. Some of the dealers here have found the best Southern furnaces short of the best No. 1 Iron, and that grade is coming rather slowly. The quotations on Southern Iron, laid down in Boston, are: No. 1, \$15.50 @ \$16; No. 2, \$14.50 @ \$15; No. 3, \$14 @ \$14.50. Pennsylvania and Western Irons are dull and unchanged.

Bar Iron.—The recent sale of a large lot of Bar Iron in this market at prices lower than other mills would sell for, by a mill a little out of the Boston trade, has been met, in the way of prices, by the other New England rolling mills, and hence the quotations on Bar Iron from mill are lower. But the store prices have not receded, the feeling being that they were down too near to the mill prices previously. Trade is quiet. Ordinary Bars from mill, 1.60¢ @ 1.70¢; from store, 1.70¢ @ 1.80¢. The best known brands from Puddled Iron are quoted at 1.85¢ @ 1.95¢ from mill, and at 2.10¢ @ 2.25¢ from store. Swedish Bars and Shapes are steady at about \$66 @ \$67.50. The demand is quiet, and consumers will probably buy only sparingly till new Iron arrives later in the season, unless advices should quote the Swedish market firmer than it is to-day.

Steel and Steel Plates.—The demand for Steel is possibly a little more quiet than last noted, but this is because of the stronger position noted at Pittsburgh, especially in Billets. The principal Pittsburgh houses advise their agents here that they are anxious that all offers out shall either be accepted at once or withdrawn, for the reason that the prices out are generally lower than they would be willing to make to-day. It is pretty well understood that these principal manufacturers have a good many orders, and that now they do not care for new business except at better terms. Quotations are very firm: Bessemer Steel, 2.15¢ @ 2½¢; Machinery, 2.10¢ @ 2½¢; Tire and Sleigh Shoe, 2¢ @ 2.10¢; American Cast, 7¢ @ 7½¢; English Cast, 13½¢ @ 15¢; American Steel Rails, \$29 at mill. There is some movement in Rails, though the New England trade is not yet up to expectation. A sale of 20,000 tons of Rails is mentioned, which are to go into the completion of the Aroostook Railroad in Maine. Plates are in quiet request, with the feeling, however, that the lowest point has been reached. Plates are quoted at: Tank, 1.95¢ @ 2¢; Shell, 2.10¢; Flange, 2.30¢ @ 2.35¢; Fire Box, 2.65¢ @ 3¢.

Structural Iron.—The request for Structural Iron is good, with still more good orders on the market, but none lately closed. The fact is that the market on Iron of this sort is really the market on Steel, and the firmer position in Pittsburgh on Steel is being sensibly felt. Agents here are urging the acceptance of bids as soon as possible, and making the argument that the next thing to be looked for is liable to be an advance. They are very positive about not offering to sell Structural Iron at a mill below quotations: Beams and Channels, 2.10¢ @ 2.20¢ from mill and 2½¢ @ 3¢ from store; Angles, 2¢ @ 2.12½¢ from mill and 2½¢ @ 2½¢ from store; Tees, 2.40¢ @ 2½¢ from mill and 2½¢ @ 3¢ from store.

Pipe and Tubes.—There is a good winter trade in Wrought-Iron Pipe and Fittings, with water-works contracts still a feature in the market. Prices are steadily maintained at the combination rates.

Scrap.—Old Iron is very dull, with almost an absolute lack of buyers. No. 1 Wrought Scrap is quotable at 50¢ $\frac{3}{4}$ 100, delivered on the cars. Old Horseshoes and special selections of Scrap Iron are quotable at 55¢ @ 60¢. Light Iron is very quiet at 80¢ @ 40¢.

The municipal authorities of Bristol, England, have formally confirmed the proposal to promote a bill to construct an ocean dock and other accessories for deep-sea commerce at Avonmouth at a cost of £1,400,000. The object is to attract to Bristol the transatlantic liners and other ocean steamship traffic.

Financial.

The so-called "gold scare" is the feature of the week in financial circles, occasioned by the low state of the Treasury and the continued large exports, which exceeded \$4,000,000 for the week ending 11th inst., and more orders for shipment remain to be executed. Exports of specie and bullion from New York in January were nearly \$15,000,000, against only \$2,000,000 for January, 1892. For the same month imports amounted to \$59,540,000, of which more than half were free goods, the largest item being about \$14,000,000 in coffee. At the same time exports dropped to \$24,801,000, exclusive of specie, facts that are calculated to attract attention in their relation to the future balance of trade. For seven months exports from New York, exclusive of specie, amount to \$208,506,000, against \$254,841,000 for the seven months ending January 31, 1892. Secretary Foster, in a conference with local bankers, received assurances that sufficient amounts of gold would be transferred to the Treasury to tide over the present emergency, but this arrangement was looked upon only as a makeshift, until Congress can act. The proposed issue of bonds was generally regarded as only an additional issue of paper that would not avail as a remedy so long as silver purchases continue. The subject of "special deposits" of gold was discussed by the associated banks, with the conclusion that they could only be received as "lawful money." Bank deposits amounting to about \$500,000,000 weekly could not be returned in gold, which, however, few customers could desire.

The Stock Exchange markets have been less active, the speculation in industrials having subsided. Reading was most active, but declined, as did Distilling, but sugar advanced. A fall both in Reading and New England followed the announcement that the Consolidated road had secured control of the Old Colony. News of the action of the banks in exchanging gold for United States legal-tender notes had a stimulating effect; but the failure of the Andrews Cate bill, providing for the repeal of the Silver Purchase law, brought about a decline and the market closed ragged. The tone was stronger on Saturday. On Monday the market was influenced to some extent by news of the engagement of \$1,500,000 gold for shipment to Europe, and also by indications that the present Administration will not issue bonds under the Resumption act. On Tuesday a Washington dispatch stating, as the result of a Cabinet meeting, that the Administration was confident of its ability to maintain the gold reserve, had a steady effect.

United States bonds closed as follows:

U. S. 4½%, 1891, extended.....	99½
U. S. 4%, 1907, registered.....	112½
U. S. 4%, 1907, coupon.....	112½
U. S. currency 6%.....	107½

The money market had a firmer tone. Time loans were in good demand, but the supply was abundant, although chiefly from foreign houses. Rates were 3½ to 4 per cent. for 30 to 60 days, and 4 to 5 for longer dates. Commercial paper was less active, the city banks being out of the market. One feature was the exchange by a number of the city banks of gold for United States legal-tender notes, to aid the Treasury in maintaining its reserve of free gold. The bank return showed a loss \$2,345,400 in cash, and of \$1,413,425 in surplus reserve, leaving the latter \$17,240,575. The public debt increased in the month of January \$3,105,800.68. The aggregate of interest and non-interest bearing debt on January 31 was \$963,803,033.63.

The merchandise markets have been

more quiet from the effects of bad weather. Wheat tended toward higher values on small fluctuations. The improved tone was partly due to a reduced visible supply to 113,000,000 bushels, and the official Russian report shows a decreased production. Hog products again advanced, prices being higher than for many years. Cotton drooped toward the close, on account of dull foreign markets; while coffee was firm and higher, the quantity afloat being comparatively small. Sugar firm at schedule prices. Rubber active, but easier. Dry goods at the close showed more animation, and collections remain strong. The whole country seems to be in a prosperous condition, and the outlook for spring continues good.

The foreign exchange market was strong and higher, owing to limited offerings of both bankers' bills and commercial acceptances and more gold will go out on Saturday.

The value of the exports of breadstuffs during January last, according to the latest returns of the Bureau of Statistics, was \$13,567,068, against exports in January, 1892, of \$30,247,281. The totals for seven months ending January 31 have been \$118,192,646 for 1893, against \$186,236,474 for 1892. The largest falling off during the seven months was in wheat, of which the exports up to January 31, 1893, were 74,264,927 bushels, against a total to January 31, 1892, of 107,693,187 bushels.

The total exports of beef, hog and dairy products during January reached a value of \$10,361,319, against a total in January, 1892, of \$12,187,846. The exports of beef and hog products alone for three months ending January 31 reached a value of \$31,485,709 for 1893, against \$32,642,914 for 1892.

The exports of mineral oil from United States for seven months ending January 31 were valued at \$24,931,506, against \$26,298,618 for 1892. The exports of cotton for five months ending January 31 were 1,413,241,934 pounds, valued at \$119,811,746, for 1893, against 1,904,392,179 pounds, valued at \$170,210,197 for 1892.

Metal Market.

Copper.—The situation remains practically the same as outlined last week. Although business in some lines of Copper and Brass goods has been checked to a certain degree of late by unfavorable weather, work in the various branches has continued active. The prospects for the manufacturing industries are referred to as being very encouraging, with particularly bright indications for an unprecedented consumption of Wire for electrical purposes. Despite these conditions and the fact that production of the metal is restricted to fairly well determined wants, the buying of Ingot continues slow in this market, and nothing in the nature of active speculative interest develops. At 12½ there is some call for Lake Superior products, with indications that considerable quantities would be taken, but small parcels are on the market at 12 05¢ @ 12.10¢ cash. Some business has been effected at 12 ½¢ delivered, but producers' representatives generally quote 12 ½¢ upward. Casting Copper has been sold at and a shade under 11 ½¢, but in some instances, as high as 11 ½¢ is still asked, despite rather disappointing demand thus far this month.

The monthly production of Copper in the United States since July has been as follows, the first column giving the aggregate return from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
July.....	9,294	924	10,218
August ...	10,807	870	11,677
September.	9,710	904	10,704
October...	9,068	1,259	10,327
November.	9,888	1,006	10,924
December..	9,872	1,174	11,046
Total.			
six months.	58,239	6,277	65,526
January...	9,187	989	10,176

The January record is therefore the lowest thus far. The foreign reporting mines show a production during January of 5736 gross tons, while the exports of fine Copper from the United States were 3171 gross tons.

Pig Tin.—Speculative dealings have been on a more restricted scale, and in other directions the business, to all accounts, loses somewhat by comparison with that of the preceding week. The falling off in jobbing and consumptive trade buying is attributed in a good measure to liberal deliveries latterly on old purchases of "futures" and considerable quantities of Tin afloat available for delivery on contracts still outstanding. The speculative branch of the trade is indirectly affected, but surface indications are that excess of "long" over "short" interest in nearby futures cuts a more conspicuous figure there, leaving it uphill work for the "bulls" to make headway. Prices have receded about 15¢ @ 100 lb during the week on both prompt and near future deliveries, or to the basis of 20 10¢, net cash, for 10-ton or larger lots. Jobbing parcels are correspondingly cheaper. According to cable advices the shipments from the Straits during the first half of February were 1125 tons, against 1750 tons in the first half of January.

Pig Lead.—The sales reported for the past week involve about 500 tons, the greater portion of which were at 3 95¢, and for near future delivery. A few single car load lots realized 3 97½¢; at the close 4¢ upward was asked. Consumers have manifested no particularly lively interest and speculative spirit continues exceedingly tame. The alleged curtailment of production during the past six weeks has, in fact, been the chief, if not the only, support to values.

Selter.—Offerings by some Western smelters have been a little urgent and of a nature reflecting pressure to sell for shipment during the three months ending with June. Along with data of output here and advices of poor chances for selling in Europe at any profit, this offering is suggestive, indicating that heavy stocks in smelters' hands are becoming tiresome, and that the home market is preferred to the European outlet at present. For deliveries during the period mentioned round lots may easily be secured at 4.30¢. Some buyers assert that *bona fide* offers a shade below that price have been made by smelters of some well-known brands.

Antimony.—The demand has been moderate and chiefly of a jobbing nature. Prices rather easy, but showing no radical change. Current quotations are 10 ½¢ @ 10 ½¢ for Hallett's, 10 ½¢ @ 10 ½¢ for LX, 10 ½¢ or Crown, and 10 ½¢ for Cookson's, as to quantity.

Tin Plate.—Orders for Cokes for spring delivery have fallen off, and outside of what may have been done direct in Oil and other special sizes, the business of the week makes an indifferent showing. Spot sales have been of strictly routine character, and rather small in the aggregate amount. Assortments here are somewhat broken, but the general supply appears adequate for present needs, and purchases are made without a great deal of difficulty at prices that ruled last week. Cable report notes that the stock at Swansea is now about 214,000 boxes, against 170,000 boxes a year ago. We quote as follows:

mands for Bessemer this year, when you remove from the calculation the mines that have been practically worked out. The feeling in regard to Bessemer Iron is improving day by day, and \$14 $\frac{1}{2}$ ton is probably soon to be realized. There has been talk of cuts amounting to 75¢ $\frac{1}{2}$ ton over last season's prices for Ore. Well, if we are to pay the vesselmen the same as last year and sell our Ores for 75¢ less $\frac{1}{2}$ ton, we may as well begin to make arrangements to go to the infirmary." Buyers certainly seem in no hurry to move. One of them said to-day, and asked that he be quoted in *The Iron Age*: "The vesselmen are claiming that you could not engage Ore tonnage to-day at less than \$1 from Escanaba; \$1.25 from Marquette, and \$1.25 from Ashland and Two Harbors. Now, the average mild rate in 1892 was 74¢ from Escanaba; 98¢ from Marquette, and \$1.15 from Ashland and Two Harbors. Let the ice in the lakes move away early in March and the vessel owners will crowd over each other in their efforts to get to the front and secure business." Vesselmen are making a wonderfully bold presentation of their rights. No one stands closer to them, perhaps, than John Mulrooney, editor of the *Marine Review*, who assures *The Iron Age* correspondent that more vessel property has changed hands and at better prices since the close of navigation in the autumn of 1892 than in any one winter in 20 years. He maintains that this illustrates the faith of the vesselmen in the stability of lake freights. Editorially he says:

"As most vessel owners are alert to the conditions surrounding their chances for profit in the business of the coming season, and realize that they now hold the upper hand, the opinion that Ore sales may be delayed into April or May grows more general with each week of inactivity. The transportation interests are also suspicious of a movement to depress the freight market, as shown by some recent negotiations regarding grain freights. The accumulation of grain at Duluth and Superior is practically equal to the utmost elevator capacity at the head of the lakes, and on this account vessel owners were of the opinion some days ago that they could readily secure a freight of 4¢ a bushel for vessels to go to Lake Superior for this grain upon the opening of navigation in the spring. They were surprised, accordingly, upon inquiry among Duluth grain shippers, to receive answer from the shippers to the effect that they held offers for a million bushels of vessel capacity to load shortly after the opening at 3½¢. At first thought this offer of tonnage at what was considered a low rate was charged to the American Steel Barge Company, but a story going the rounds of the lakes during the past few days attributes the proposed grain deal to an effort of one of the big Iron Ore companies to so affect the freight market as to admit of Ore being sold at a reduction on last year's prices. The company charged with this offer to carry Duluth grain is the Minnesota Steamship Company, an adjunct of the Minnesota Iron Company and Illinois Steel Company, and it is said that the plan was to charter their fleet of steel steamers for one or two trips if forced to contract on the offer, and then depend upon the effect produced in lake freights to cover outside tonnage for early trips with Ore. The story indicates the feeling among vessel owners as to freights, and their suspicion of being deprived of the advantage which they now hold, and is given simply for what it is worth."

It can be readily inferred from these interviews that the vesselmen will have something to say about fixing the prices to be paid for the bulk of Ore to be mined in 1893. From, perhaps, the most conservative Iron man in the city this statement was received to-night: "Business

is improving and by the time navigation opens you will see prices for Ore within 25¢ or 35¢ of those prevailing last year."

Pig Iron.—During the week ending at noon to day 28,000 tons of Ore were sent forward to the furnaces, as compared with 27,000 tons for the same week in 1892. The old Ore on the docks is in better demand and many stock piles are being rapidly cut down. Eastern furnace men are making inquiries for Bessemer Ore and they are likely to figure conspicuously in the movements of the market for 1893. Non-Bessemer Ores on the docks are bringing \$8 per ton and are in better demand than for several weeks past.

Pig Iron.—There has been a steady improvement in the Bessemer market during the past week. Sales of Bessemer are reported at figures close to \$13.65 and dealers quote to day \$13.65 @ \$13.80. This is something of an improvement over the very low prices of a week and ten days ago. A local dealer just returned from Pittsburgh claims to have positive assurance that during the decline Bessemer Iron sold for less than \$13 $\frac{1}{2}$ ton. It is now recovering splendidly and seems to be likely to still further improve. It is said that the actual supply of Bessemer would only last 20 days if the supply was to be suddenly cut off, but the production keeps up so well that the wants of buyers are at no time really pressing. Gray Forge is worth \$12.40 @ \$12.50, Cleveland, and No. 1 Foundry is still quoted at \$14, No. 2 at \$13.50 and No. 3 at \$13.

Muck Bar.—Dealers report a slight improvement and give quotations to day as \$24.50 @ \$24.75, with a fair demand.

Serap.—The market has again relapsed into a condition of extreme dullness. No. 1 Railroad Wrought at \$15 @ \$15.25 $\frac{1}{2}$ net ton is in slight demand. Cast-Iron Borings are quoted at \$7.50 @ \$7.60 $\frac{1}{2}$ gross ton and Wrought-Iron Turnings at \$10 $\frac{1}{2}$ gross ton.

Old Rails.—The market continues weak, with Old Americans quoted nominally at \$19.50 @ \$19.75.

Manufactured Iron.—The outlook is brighter and a fairly liberal amount of Common Bar is being placed at 1.60¢ @ 1.65¢.

Freights.—Ore: Cleveland to Valley Points, 62½¢; Cleveland to Pittsburgh, \$1.05. Pig Iron: Valley Points to Cleveland, 60¢ $\frac{1}{2}$ ton; to Pittsburgh, 60¢, Muck Bar. Blooms, Billets, Scrap, Iron and Steel Rails, Old Wheels, &c.: Valley Points to Cleveland, 70¢ $\frac{1}{2}$ ton; to Pittsburgh, 75¢ $\frac{1}{2}$ ton; to Boston, \$8.50 $\frac{1}{2}$ ton; to New York, \$8.10 $\frac{1}{2}$ ton; to Philadelphia, \$2.70 $\frac{1}{2}$ ton.

Boston.

Office of *The Iron Age*, 146 Franklin St.,
BOSTON, February 15, 1893.

Pig Iron.—The demand for Pig Iron in this market continues quiet. Still there is a moderate business doing, from the fact that the foundry people are busy and are using a good volume of Iron. Some of them are using an unusually full quantity, and they must necessarily buy considerable Iron, in order to keep up their supply. But they buy in rather small lots, as a rule. There are still some deliveries going on in Iron bought some time ago. Some of the dealers here have found the best Southern furnaces short of the best No. 1 Iron, and that grade is coming rather slowly. The quotations on Southern Iron, laid down in Boston, are: No. 1, \$15.50 @ \$16; No. 2, \$14.50 @ \$15; No. 3, \$14 @ \$14.50. Pennsylvania and Western Irons are dull and unchanged.

Bar Iron.—The recent sale of a large lot of Bar Iron in this market at prices lower than other mills would sell for, by a mill a little out of the Boston trade, has been met, in the way of prices, by the other New England rolling mills, and hence the quotations on Bar Iron from mills are lower. But the store prices have not receded, the feeling being that they were down too near to the mill prices previously. Trade is quiet. Ordinary Bars from mill, 1.60¢ @ 1.70¢; from store, 1.70¢ @ 1.80¢. The best known brands from Puddled Iron are quoted at 1.85¢ @ 1.95¢ from mill, and at 2.10¢ @ 2.25¢ from store. Swedish Bars and Shapes are steady at about \$66 @ \$67.50. The demand is quiet, and consumers will probably buy only sparingly till new Iron arrives later in the season, unless advices should quote the Swedish market firmer than it is to-day.

Steel and Steel Plates.—The demand for Steel is possibly a little more quiet than last noted, but this is because of the stronger position noted at Pittsburgh, especially in Billets. The principal Pittsburgh houses advise their agents here that they are anxious that all offers out shall either be accepted at once or withdrawn, for the reason that the prices out are generally lower than they would be willing to make to-day. It is pretty well understood that these principal manufacturers have a good many orders, and that now they do not care for new business except at better terms. Quotations are very firm: Bessemer Steel, 2.15¢ @ 2½¢; Machinery, 2.10¢ @ 2½¢; Tire and Sleigh Shoe, 2¢ @ 2.10¢; American Cast, 7¢ @ 7½¢; English Cast, 13½¢ @ 15¢; American Steel Rails, \$29 at mill. There is some movement in Rails, though the New England trade is not yet up to expectation. A sale of 20,000 tons of Rails is mentioned, which are to go into the completion of the Aroostook Railroad in Maine. Plates are in quiet request, with the feeling, however, that the lowest point has been reached. Plates are quoted at: Tank, 1.95¢ @ 2¢; Shell, 2.10¢; Flange, 2.30¢ @ 2.35¢; Fire Box, 2.65¢ @ 3½¢.

Structural Iron.—The request for Structural Iron is good, with still more good orders on the market, but none lately closed. The fact is that the market on Iron of this sort is really the market on Steel, and the firmer position in Pittsburgh on Steel is being sensibly felt. Agents here are urging the acceptance of bids as soon as possible, and making the argument that the next thing to be looked for is liable to be an advance. They are very positive about not offering to sell Structural Iron at a mill below quotations: Beams and Channels, 2.10¢ @ 2.20¢ from mill and 2½¢ @ 3¢ from store; Angles, 2¢ @ 2.12½¢ from mill and 2½¢ @ 2½¢ from store; Tees, 2.40¢ @ 2½¢ from mill and 2½¢ @ 3½¢ from store.

Pipe and Tubes.—There is a good winter trade in Wrought-Iron Pipe and Fittings, with water-works contracts still a feature in the market. Prices are steadily maintained at the combination rates.

Serap.—Old Iron is very dull, with almost an absolute lack of buyers. No. 1 Wrought Scrap is quotable at 50¢ $\frac{1}{2}$ 100, delivered on the cars. Old Horseshoes and special selections of Scrap Iron are quotable at 55¢ @ 60¢. Light Iron is very quiet at 30¢ @ 40¢.

The municipal authorities of Bristol, England, have formally confirmed the proposal to promote a bill to construct an ocean dock and other accessories for deep-sea commerce at Avonmouth at a cost of £1,400,000. The object is to attract to Bristol the transatlantic liners and other ocean steamship traffic.

Financial.

The so-called "gold scare" is the feature of the week in financial circles, occasioned by the low state of the Treasury and the continued large exports, which exceeded \$4,000,000 for the week ending 11th inst., and more orders for shipment remain to be executed. Exports of specie and bullion from New York in January were nearly \$15,000,000, against only \$2,000,000 for January, 1892. For the same month imports amounted to \$59,540,000, of which more than half were free goods, the largest item being about \$14,000,000 in coffee. At the same time exports dropped to \$24,801,000, exclusive of specie, facts that are calculated to attract attention in their relation to the future balance of trade. For seven months exports from New York, exclusive of specie, amount to \$208,506,000, against \$254,841,000 for the seven months ending January 31, 1892. Secretary Foster, in a conference with local bankers, received assurances that sufficient amounts of gold would be transferred to the Treasury to tide over the present emergency, but this arrangement was looked upon only as a makeshift, until Congress can act. The proposed issue of bonds was generally regarded as only an additional issue of paper that would not avail as a remedy so long as silver purchases continue. The subject of "special deposits" of gold was discussed by the associated banks, with the conclusion that they could only be received as "lawful money." Bank deposits amounting to about \$500,000,000 weekly could not be returned in gold, which, however, few customers could desire.

The Stock Exchange markets have been less active, the speculation in industrials having subsided. Reading was most active, but declined, as did Distilling, but sugar advanced. A fall both in Reading and New England followed the announcement that the Consolidated road had secured control of the Old Colony. News of the action of the banks in exchanging gold for United States legal-tender notes had a stimulating effect; but the failure of the Andrews Cate bill, providing for the repeal of the Silver Purchase law, brought about a decline and the market closed ragged. The tone was stronger on Saturday. On Monday the market was influenced to some extent by news of the engagement of \$1,500,000 gold for shipment to Europe, and also by indications that the present Administration will not issue bonds under the Resumption act. On Tuesday a Washington dispatch stating, as the result of a Cabinet meeting, that the Administration was confident of its ability to maintain the gold reserve, had a steady effect.

United States bonds closed as follows:

U. S. 4½%, 1891, extended.....	99½
U. S. 4%, 1897, registered.....	112½
U. S. 4%, 1907, coupon.....	112½
U. S. currency 6%	107½

The money market had a firmer tone. Time loans were in good demand, but the supply was abundant, although chiefly from foreign houses. Rates were 3½ to 4 per cent. for 30 to 60 days, and 4 to 5 for longer dates. Commercial paper was less active, the city banks being out of the market. One feature was the exchange by a number of the city banks of gold for United States legal-tender notes, to aid the Treasury in maintaining its reserve of free gold. The bank return showed a loss \$2,345,400 in cash, and of \$1,418,425 in surplus reserve, leaving the latter \$17,240,575. The public debt increased in the month of January \$3,105,800.68. The aggregate of interest and non-interest bearing debt on January 31 was \$963,803,033.63.

The merchandise markets have been

more quiet from the effects of bad weather. Wheat tended toward higher values on small fluctuations. The improved tone was partly due to a reduced visible supply to 113,000,000 bushels, and the official Russian report shows a decreased production. Hog products again advanced, prices being higher than for many years. Cotton drooped toward the close, on account of dull foreign markets; while coffee was firm and higher, the quantity afloat being comparatively small. Sugar firm at schedule prices. Rubber active, but easier. Dry goods at the close showed more animation, and collections remain strong. The whole country seems to be in a prosperous condition, and the outlook for spring continues good.

The foreign exchange market was strong and higher, owing to limited offerings of both bankers' bills and commercial acceptances and more gold will go out on Saturday.

The value of the exports of breadstuffs during January last, according to the latest returns of the Bureau of Statistics, was \$13,567,068, against exports in January, 1892, of \$80,247,281. The totals for seven months ending January 31 have been \$118,192,646 for 1893, against \$186,236,474 for 1892. The largest falling off during the seven months was in wheat, of which the exports up to January 31, 1893, were 74,264,927 bushels, against a total to January 31, 1892, of 107,698,187 bushels.

The total exports of beef, hog and dairy products during January reached a value of \$10,361,319, against a total in January, 1892, of \$12,187,846. The exports of beef and hog products alone for three months ending January 31 reached a value of \$31,485,709 for 1893, against \$32,642,914 for 1892.

The exports of mineral oil from United States for seven months ending January 31 were valued at \$24,931,506, against \$26,298,618 for 1892. The exports of cotton for five months ending January 31 were 1,413,241,934 pounds, valued at \$119,811,746, for 1893, against 1,904,892,179 pounds, valued at \$170,210,197 for 1892.

Metal Market.

Copper.—The situation remains practically the same as outlined last week. Although business in some lines of Copper and Brass goods has been checked to a certain degree of late by unfavorable weather, work in the various branches has continued active. The prospects for the manufacturing industries are referred to as being very encouraging, with particularly bright indications for an unprecedented consumption of wire for electrical purposes. Despite these conditions and the fact that production of the metal is restricted to fairly well determined wants, the buying of Ingots continues slow in this market, and nothing in the nature of active speculative interest develops. At 12¢ there is some call for Lake Superior products, with indications that considerable quantities would be taken, but small parcels are on the market at 12 05¢ @ 12.10¢ cash. Some business has been effected at 12½¢, delivered, but producers' representatives generally quote 12½¢ upward. Casting Copper has been sold at and a shade under 11½¢, but in some instances, as high as 11½¢ is still asked, despite rather disappointing demand thus far this month.

The monthly production of Copper in the United States since July has been as follows, the first column giving the aggregate return from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
July.....	9,294	924	10,218
August ...	10,807	870	11,677
September.	9,710	904	10,704
October...	9,668	1,289	10,957
November.	9,888	1,006	10,924
December...	9,873	1,174	11,046
Total.			
six months.	59,239	6,277	65,526
January...	9,187	989	10,176

The January record is therefore the lowest thus far. The foreign reporting mines show a production during January of 5736 gross tons, while the exports of fine Copper from the United States were 3171 gross tons.

Pig Tin.—Speculative dealings have been on a more restricted scale, and in other directions the business, to all accounts, loses somewhat by comparison with that of the preceding week. The falling off in jobbing and consumptive trade buying is attributed in a good measure to liberal deliveries latterly on old purchases of "futures" and considerable quantities of Tin afloat available for delivery on contracts still outstanding. The speculative branch of the trade is indirectly affected, but surface indications are that excess of "long" over "short" interest in nearby futures cuts a more conspicuous figure there, leaving it uphill work for the "bulls" to make headway. Prices have receded about 15¢ @ 100 lb during the week on both prompt and near future deliveries, or to the basis of 20 10¢, net cash, for 10-ton or larger lots. Jobbing parcels are correspondingly cheaper. According to cable advices the shipments from the Straits during the first half of February were 1125 tons, against 1750 tons in the first half of January.

Pig Lead.—The sales reported for the past week involve about 500 tons, the greater portion of which were at 3 95¢, and for near future delivery. A few single car load lots realized 3.97½¢; at the close 4¢ upward was asked. Consumers have manifested no particularly lively interest and speculative spirit continues exceedingly tame. The alleged curtailment of production during the past six weeks has, in fact, been the chief, if not the only, support to values.

Spelter.—Offerings by some Western smelters have been a little urgent and of a nature reflecting pressure to sell for shipment during the three months ending with June. Along with data of output here and advices of poor chances for selling in Europe at any profit, this offering is suggestive, indicating that heavy stocks in smelters' hands are becoming tiresome, and that the home market is preferred to the European outlet at present. For deliveries during the period mentioned round lots may easily be secured at 4.30¢. Some buyers assert that *bona fide* offers a shade below that price have been made by smelters of some well-known brands.

Antimony.—The demand has been moderate and chiefly of a jobbing nature. Prices rather easy, but showing no radical change. Current quotations are 10½¢ @ 10½¢ for Hallett's, 10½¢ @ 10½¢ for LX, 10½¢ or Crown, and 10½¢ for Cookson's, as to quantity.

Tin Plate.—Orders for Cokes for spring delivery have fallen off, and outside of what may have been done direct in Oil and other special sizes, the business of the week makes an indifferent showing. Spot sales have been of strictly routine character, and rather small in the aggregate amount. Assortments here are somewhat broken, but the general supply appears adequate for present needs, and purchases are made without a great deal of difficulty at prices that ruled last week. Cable report notes that the stock at Swansea is now about 214,000 boxes, against 170,000 boxes a year ago. We quote as follows:

Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, scarce; light weights, \$5.10 for 100 lb, \$4.95 @ \$5.00 for 95 lb, \$4.80 @ \$4.85 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85. IC Charcoals—Melyn grade, scarce; Crosses, \$8; Allaway grade, any assortment, \$5.70; Crosses, \$7; Grange grade, any assortment, \$5.85; Crosses, \$7.10. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.75; do., 20 x 28, \$15.50; Dean grade, 14 x 20, \$5.30 @ \$5.37; do., 20 x 28, \$10.50 @ \$10.70; D. R. D. grade, 14 x 20, \$5.25; do., 20 x 28, \$10.45; Dyffryn, 14 x 20, \$5.50; do., 20 x 28, scarce. Wasters—S. T. P. grade, 14 x 20, \$5; do., 20 x 28 \$9.75; Abercarne grade, 14 x 20, \$4.95; do., 20 x 28, \$9.62½.

C. Kirchhoff, special agent of the U. S. Geological Survey, reports the production of Pig Lead in the United States as follows:

Year.	Total production.	Desilverized Lead.	Non-Argentiferous Lead.
1886.....	135,629	114,829	20,800
1887....	160,700	135,552	25,148
1888.....	180,555	151,465	29,090
1889.....	182,967	153,709	29,258
1890.....	161,754	130,403	31,351
1891.....	202,406	171,009	31,397
1892.....	213,262	181,584	31,678

Included in the above production is 5039 tons of Antimonial Lead, against 4043 tons in 1891. The Lead contents of Mexican and Canadian Ores imported were 26,734 tons in 1892, and there were refined in bond and exported 12,874 tons. Partial stocks, as reported by producers, were 5654 net tons of refined Lead on January 1, 1893, as compared with 6739 tons by the same parties on January 1, 1892.

Coal Market.

With milder weather and plenty of Coal, the Anthracite market is "sloppy." That is to say, while the combine hold to the regular schedule, there is a plenty of Coal around at lower prices. Shippers speak of considerable shading. Stove Coal having been sold in New York as low as \$4.50, f.o.b., per ton, which is 25¢ under the gross circular. All domestic sizes are in excess of the demand. Steam sizes are easier and better in supply, but Pea Coal is slow in delivery, so that new purchasers take their turn. Pea is \$2.25, alongside. Buckwheat \$2 @ \$2.10, alongside, and not as easy as Pea. Collieries in Schuylkill County are starting up again, now that cars can be had to carry off the product. Nothing is likely to be done at to-day's meeting of agents.

Bituminous Coal is \$3.50, alongside, and in some cases \$3.75 is paid, but the market is the same as a week ago. Shippers are behind on contract orders, and on others there is some delay, chiefly by reason of lack of cars. In this respect the situation is improving. Tidewater shipments have been resumed from New York harbor, but the greater part of the Coal going eastward is being shipped via all rail routes.

Week's production, 829,831 tons; for the year, 3,581,604 tons; Reading tonnage, 450,000 tons. The Pennsylvania Railroad tonnage for the week was 311,648 tons Coal and 112,253 tons Coke.

A Columbus, Ohio, special says that operators representing 95 per cent. of the soft Coal output of Hocking Valley have agreed to form a selling corporation, and are taking steps to carry out the idea, but have abandoned the plan for a trust.

The Glendon Colliery at Mahanoy City, Penn., formerly owned and operated by J. C. Hayden & Co., has been leased by the Lehigh division of the Reading Coal & Iron Company. This colliery has an annual production of 100,000 tons. To increase the output great improvements are in contemplation.

A new use has been found for Culm. The Lehigh & Wilkesbarre Coal Company have just contracted for having an 8-inch bore hole sunk over the abandoned workings of their great colliery—the Nottingham—at Plymouth. It will penetrate to a depth of nearly 700 feet, and will then be used to flush the worked-out portions of the mine with Culm.

Under this flushing process a new support is furnished, and new chambers and breasts can be driven around the solidified Culm, thus making it possible to take out all but 5 per cent. of the entire deposit of Coal as it originally existed.

New York.

Office of *The Iron Age*, 96-102 Reade street, New York, February 15, 1893.

Pig Iron.—The market is without any improvement and shows no signs of increasing activity. Quite a number of good orders have been taken lately in the Canadian market. We quote Northern brands at \$14.75 @ \$15.25 for No. 1; \$14 @ \$14.50 for No. 2, \$13 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.75 @ \$15 for No. 1; \$13.75 @ \$14 for No. 2 and No. 1 Soft; \$13.25 @ \$13.50 for No. 2 Soft; \$12.75 @ \$13 for Gray Forge.

Ferromanganese and Spiegeleisen.—Comparatively little is being done in Ferromanganese, which we continue to quote \$56.25 @ \$56.75, tidewater. We note a sale of a few thousand tons of Spiegeleisen, prompt delivery, to an Eastern Rail mill. We quote 20% Spiegeleisen, nominally, \$25.50 @ \$26.

Billets and Rods.—There has been no business of consequence in this market in foreign or domestic material. We quote Steel Billets, tidewater, \$24.50 @ \$24.75; foreign, \$29 @ \$29.50; Wire Rods, \$32.25 @ \$32.75; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$54.50 @ \$56.

Steel Rails.—Some large contracts have been closed by Eastern mills, the week's aggregate of sales, in which all the works participated to a greater or lesser degree, figuring up to the best record thus far made this year in a similar space of time. The aggregate is 75,000 tons. We estimate that the three Eastern mills have thus far closed for 1893 delivery close upon 225,000 tons, which includes nearly all the large renewal purchases in their own territory. We understand that there is only one order as large as 25,000 tons still unfilled. Of course the total of the requirements of the smaller roads will make a respectable aggregate. Then quite a fair amount of business comes to some of the Eastern mills from the South, which has thus far placed little work. Western mills have done nothing in Eastern territory this year.

Manufactured Iron and Steel.—The closing of the contract for the Manhattan Life Building was delayed from last Thursday to to-day, and it is not known yet who has secured the work, which is the largest in the market for some time past. Competition for it was known to be very keen. In Plates some interest is being aroused by an inquiry for 25,000 lb Open-Hearth Light Plates, No. 4 and No. 6 chiefly, for a Pacific Coast water works scheme. We note also the taking of 12 short span bridges for the Havana & Western road in Cuba, taken by a leading bridge concern. We quote Beams at 2.25 @ 2.75 for small lots and

2@ @ 2.35 for round lots, according to sizes; Angles, 1.85 @ 2@; Sheared Plates, 1.85 @ 2.10@; Tees, 2.10@ @ 2.30@; Channels, 2.10@ @ 2.20@, on dock. Car Truck Channels, 2@ @ 2.10@. Steel Plates are 1.85 @ 2@ for Tank; 2.10@ @ 2.25@ for Shell; 2.40@ @ 2.50@ for Flange; 2.5@ @ 2.75@ for Marine, and 2.80@ @ 2.80@ for Fire Box, on dock. Refined Bars are 1.65@ @ 1.9@, on dock; Common, 1.55@ @ 1.60@. Scrap Axles are quotable at 1.90@ @ 2.10@, delivered. Steel Axles, 1.85@ @ 2@, and Links and Pins, 1.85@ @ 2.10@; Steel Hoops, 1.80@ @ 1.90@, delivered.

Track Material.—A good deal of business has been placed lately, but at very low prices, competition among the mills being very keen. In Fish Plates the Rail mills generally capture the largest orders. The quotations below have been shaded in some instances. Spikes, 1.87½ @ 1.90@; Fish Plates, 1.55@ @ 1.60@; Track Bolts, square nuts, 2.40@ @ 2.45@, and hexagon nuts, 2.55@ @ 2.60@, delivered.

Freights.—Rates to New York are:

Pig Iron.	Per ton.
Birmingham district.....	\$4.01
Lehigh Valley.....	.60
Pittsburgh.....	1.90
Manufactured Iron and Steel.	Per 100 lb.
Lehigh Valley.....	9@
Pittsburgh.....	18@
Billets.	Per ton.
Harrisburg district.....	\$1.35
Pittsburgh district.....	2.30

Jacob Fegeley and W. M. Gordon, receivers of the Pottstown Iron Company, have announced that all orders in hand, and those coming in daily, are attended to promptly.

The German Iron Trade.

(One mark per metric ton is equivalent to 24.8 cents per gross ton.)

DUSSELDORF, January 28, 1893.

Iron and Steel.—The situation of the Westphalian market has rather deteriorated since the beginning of the new year. The Pig Iron business is in spite of the blowing out of about six furnaces, a difficult one, and Forge Pig, Bessemer and Thomas Pig are down to a very low point, while Foundry Pig is holding its own. Foundry Pig No. 1 and Hematite are at 63 marks (\$15.38), No. 3 at 55 marks \$18.30 ton (\$18.64), Siegen quality Pig as low as 41 marks (\$10.17). The steel works are lacking occupation; most of them have made reductions. The Gutehoffnungswaerke, near Oberhausen, have dismissed about 300 workmen. The price of billets holds at about 74 marks (\$18.35) \$18.35 ton. Bar Iron and Steel are offered at 105 marks @ 100 marks per ton respectively (1.16@ @ 1.11@ per pound), while the syndicate endeavored to keep the prices from 8 to 10 marks higher. The Boiler Plate market is very dull in consequence of the want of orders in the car building and construction shops. Tenders for 1100 tons of Bar Iron, 435 tons Fire-Grate Bars, 185 tons Heavy Plates, 151 tons Sheets, &c., are open in Cologne on February 9 in the Royal Railway Direction, Left Rhine.

Coal.—This morning there was a general meeting of the Westphalian Coal pit owners in Dortmund for taking final action in regard to the proposed syndicate. Out of a production of 33,706,244 tons involved, 31,951,369 tons, or 92 per cent., were represented in the meeting, which resolved almost unanimously to establish the syndicate at a second meeting called for February 16. This will be a very important feature of our Coal market in the near future.

The Mannesmann Tube Company has made a contract with the Antwerp Hydro-

Electrical Society for the delivery of the whole steel tubes of 200, 140 and 100 mm. of diameter for a pressure of 50 atmospheres.

Bockenheim, a suburb of Frankfurt-on-Main, put in operation on January 1 a central electricity work for power distribution. The steam engines which they have now at disposal have about 540 horse-power. The plant is on the Lahmeyer system, and an electrical current, which is equivalent to 1 horse-power, is sold at about 15 pfennig.

The Hamburg petroleum tank steamers have made in 1892 with their three steamers 22 voyages and made a profit of 538,427 marks, which enabled them to declare a dividend of 11 per cent.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 15, 1893.

There has been a still further advance in Scotch Iron warrants for immediate delivery, and there are no signs yet of any abatement of the "squeeze." Prompts realized 48/- on Tuesday, while one to three months' futures were sold at 42/-. Little business has been done in the ring, but settlements were made privately, and it is believed that the "short" account has been reduced considerably. The speculative manipulation is hampering business with consumers to some extent. Other warrants have been practically neglected. Prices have not varied much from 35/- for Cleveland and 45/7½ @ 45/9 for Hematites Stocks in public stores include 389,000 tons Scotch and 38,000 tons Cleveland. There are at present in blast a total of 66 Scotch and 124 English furnaces.

Speculative buying was fairly active early in the week, and prices advanced. The demand was represented as coming from the American market. Upon cessation of orders from that quarter interest became very tame and prices gradually weakened.

Copper has been flat throughout the week owing to poor consumptive demand and absence of a speculative interest. Offerings have been quite free. Consumers are buying indifferently.

Tin-Plate business has been very fair. Dealings were mainly in Ternes and Oil sizes for Russia and 'Frisco account. Operations for 'Frisco have been checked the past few days, however, by a demand from makers for an advance of 3d over late prices. There has been more doing in Black Plate. Stocks of Plates at Swansea are returned as being 214,000 boxes, against 170,000 boxes at the corresponding period last year.

Scotch Pig Iron.—Demand for makers Iron does not change and prices vary in a slight degree only.

No. 1 Coltness, f.o.b. Glasgow.....	54 6
No. 1 Summerlee, " "	51/
No. 1 Gartsherrie, " "	51/6
No. 1 Langloan, " "	53/
No. 1 Carnbroe, " "	48/
No. 1 Shotts at Leith	52 6
No. 1 Glengarnock, Ardrossan	49 6
No. 1 Dalmenyton, " "	48/
No. 1 Eginton, " "	46/
Steamer freights, Glasgow to New York, 1/;	
Liverpool to New York, 7/6	

Cleveland Pig.—The market quiet and prices rather weak at 35, f.o.b. shipping port, for No. 8 Middlesborough.

Bessemer Pig.—No improvement in demand, and the market easy at 47/- for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Business is slow and prices are rather weak, with English 80% quoted at £11. 5/-, f.o.b. shipping port.

Steel Rails.—A quiet market, but former prices generally asked. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Slabs.—Market remains very quiet. Bessemer quoted at £4, f.o.b. at shipping point.

Steel Billets.—Demand continues slow and prices are in buyers' favor. Bessemer, 2½ x 2½ inches, quoted at £4, f.o.b. shipping point.

Steel Blooms.—Business light and prices without change. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Old Iron Rails.—The market remains quiet and unchanged. Tees quoted at £2. 7/6 @ £2. 10/- and Double Heads at £2. 10/- @ £2. 12/6, f.o.b.

Scrap Iron.—Prices steady but business slow. Heavy Wrought Iron quoted at £2, f.o.b.

Crop Ends.—Market dull, and prices nominal. Bessemer quoted at £2. 7/6 @ £2. 10/-, f.o.b.

Manufactured Iron.—There is no change in any department, business being moderate, while prices are easy. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ordinary Marked Bars	8 0 0	0
" Common "	6 5 0	0
Staff. Blk's Sheet, singles	7 7 6	0
Welsh Bars (f.o.b. Wales)	5 7 6	0

Tin Plate.—The market closes firm under the influence of fair demand for special sorts. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	13/6	14/0
IC Bessemer Steel, Coke finish	12/0	12/6
IC Siemens " "	12/3	12/6
IC Coke, B. V. grade 14 x 20	12/0	12/6
Charcoal Terne, Dean grade	13/6	14/

Pig Tin.—Slightly more activity at the close and prices a shade firmer. Straits quoted at £91. 12/6 for spot and £92. 5/- for three months' futures.

Copper.—Market closes firmer under freer trading in futures. Merchant Bars quoted at £45. 10/-, spot, and £46 three months' futures. Best selected, £49. 10/-.

Lead.—Very quiet market and prices still rather weak at £9. 10/- for Soft Spanish.

Spelter.—Demand continues light, and prices are still easy at £17. 2/6 for ordinary Silesian.

St. Louis.

(By Telegraph, February 15.)

Pig Lead.—This metal has been extremely active during the past few days, over 700 tons having been sold in that time at 3.70¢. At this price the market is firm, and the outlook is considered encouraging for perhaps a trifling advance. Stocks of Lead are not heavy, and the indications point to a good spring trade.

Spelter.—The tendency of Spelter is downward, and sales of several hundred tons have been made during the past week on the basis of 4¢. Stocks continue to increase, and with an improved Iron market the future of Spelter does not appear very bright. Last year 7% of the production of the United States was sold for export, while the price ruling in London to-day precludes the possibility of making any sales whatever for foreign account. The result is this percentage is left on our own hands, thus adding to the already large stocks.

Trade Publications.

WE HAVE RECEIVED from the Pennsylvania Diamond Drill & Mfg. Company of Birdsboro, Pa., a catalogue describing their portable radial drills, diamond drills, hand, steam, hydraulic and belt cranes, steam engines, &c.

ALBERT L. COLBURN of New Haven, Conn., has issued a new catalogue describing the portable drilling machines made by him. He states that these machines can be as easily placed and handled as a ratchet drill, and will drill any distance or direction from the counter shaft, or in any position. They are especially adapted to drilling pieces which are not easily moved or which cannot be readily adjusted under other drilling machines. It is not necessary to take these machines down when drilling to a line in starting a hole to make the drill run central. Neither will they drop down in going through a piece of work, leaving the top of the machine free to fall over and break off the drills. In fact, their similarity to the hand drilling machines, found in a large majority of machine shops, enables the user to become familiar with them the first time using. Many manufacturers set their machines level on the floor and build them up by the use of these drills, not taking their machinery down or disturbing their level position until the machine is ready to ship or be moved to the store room.

THE HOLLY MFG. COMPANY of Lockport, N. Y., manufacturers of the Gaskill-Holly pumping engines, have issued a pamphlet concerning the business of the company. The first Gaskill high-duty pumping engine was introduced at the Saratoga Springs Water Works in 1882, and has been in continuous and successful operation ever since. The average daily duty of this engine for the past seven years has been 105,524,137 foot pounds, which duty is figured direct from the total coal consumed, with no deductions whatever for ashes, steam for heating or other purpose. Since that date 183 of these engines have been sold, the past two years' business having been the best in the history of the company.

THE HILLES & JONES COMPANY of Wilmington, Del., have just issued a very elaborate catalogue describing the tools built by them. The introduction states that "extensive additions and modifications to our line of patterns have been made since the catalogue issue of 1889, and, in fact, changes and improvements are continually being made to keep our product up to the requirements of the trade." The first part of the book describes single punching or shearing machines, of which there are 83 standard sizes made, ranging from 1800 pounds to 100,000 pounds in weight and from 5 inches to 72 inches depth of throat. These machines are all of a heavy and substantial design, self-contained, well proportioned, and amply strong for their specified duty. The metal is well distributed and the wearing surfaces are large. Part 2 describes special single punching or shearing machinery, which differs from the standard machines mainly in the shape of the nose, and special punching and shearing attachments to suit the various requirements. There are 61 standard sizes of combined punching and shearing machines made, ranging from 3000 pounds to 100,000 pounds in weight and from 5 to 60 inches depth of throat. Then follow descriptions of plate shearing machinery, angle iron shearing machines, bar and billet shearing machines, gate shears, horizontal flange, punches, plate bending rolls, plate straightening machinery, plate planers, vertical milling machines, drills, &c. The book is quarto size, printed on very heavy paper, and the engravings are admirable.

HARDWARE.

Condition of Trade.

FROM THE SPECIAL REPORTS given in the following columns our readers will obtain an excellent impression as to the condition of trade in the respective centers. It will be observed that several of our correspondents refer to the large volume of business, the demand apparently setting in very satisfactorily. The severe weather which has prevailed has interfered seriously with business in many parts of the country and especially with the delivery of goods on account of the congested condition of the railroads. Retailers are beginning to place their orders quite freely and the jobbing houses are thus well occupied. Larger buyers are purchasing freely of staple goods and of miscellaneous Hardware needed to complete or replenish their assortments. The impression prevails that in many lines, heavy goods especially, prices are low enough to justify liberal purchases, but notwithstanding the amount of business done there is but little improvement in the tone of the market. There is somewhat more complaint in regard to collections than there has been.

Chicago.

(By Telegraph.)

Shelf Hardware moves on in the even tenor of its way with nothing of any special nature to report. The volume of business is steadily increasing, as is customary at this time of the year, but prices show no change of any consequence. Some little annoyance is felt here on account of the increase in syndicate buying, which may become a seriously disturbing element. Small retailers throughout the Northwest are now being taken into these syndicates, with headquarters at Pittsburgh or New York. Their orders are too small for direct shipment from factory, but after receiving quotations on such business they turn to the jobbers here and elsewhere in the Northwest and insist on being supplied at these rates. This, of course, cannot be done, as jobbers are hardly to be expected to do business at a loss, but explanations take time and cause much correspondence, leading to continual trouble. The jobber is not regarded as a convenience, carrying stocks which can be quickly drawn upon, and, therefore, entitled to a fair profit on his business, but as one who merits no consideration whatever.

St. Louis.

(By Telegraph.)

The demand for Hardware is exceedingly heavy. Jobbers report a largely increased demand for Shelf and Heavy Hardware. In the matter of Carriage

Bolts, Locks, Door Knobs, Corrugated Strap Hinges, Trace Chains, &c., there is an absolute scarcity. Trace Chains particularly are exceedingly hard to get, and prices have advanced in consequence. The Texas trade is very heavy, and the entire Southwestern trade shows a general improvement. Prices are perhaps a little better, but the changes are so few that they are hardly noticeable.

Baltimore.

CARLIN & FULTON.—Since our last letter there has been but little change in the condition of trade, and orders are coming in quite freely, except from such sections as are inaccessible on account of ice and snow and bad roads.

The milder weather and rains of this month have opened the harbors and removed the blockade which interfered with water transportation, but the effect upon the country dirt roads has been equally bad and will continue to be until some systematic effort is made to lay out, build and keep up roads upon scientific principles.

We suppose by the end of this week the Nail manufacturers will have decided upon a uniform schedule applying to both the Eastern and Western associations, and if this card can be made the same as that for Wire Nails, it will be a great relief to the dealer, and put an end to the confusion which now exists since the adoption of the card of January 31, by the Eastern Nail Association.

Whatever conclusion may be arrived at, the trade can depend upon one thing, which is, that the manufacturers intend to get more money for Nails no matter what the card may be, and the recent closing down of one of the largest mills in the East emphasizes the necessity for selling the manufactured article at something more than the cost of raw material.

As prices of nearly all staples have never been lower, it is to be remarked that stocks at the factories are not large, and with the delay which exists in all deliveries by the railroads throughout the country, dealers will do well to keep up their assortments and not rely upon the chances of getting goods promptly at the last minute, when they should be in their warehouses for immediate sale.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—We are able to report continued activity in trade during the last two weeks, business conditions having undergone no material change; neither is there any evidence of trade disturbance in the near future. Although a portion of the time the weather would not be considered favorable for large merchandise disbursements, nevertheless it is considered by all parties as quite satisfactory.

There has been considerable detention and great complaint in regard to the delay in goods reaching their destination. Although traffic has opened on the rivers, the freight had accumulated at shipping

stations, owing to the blockade during the recent cold weather, and the regular routine of railroad transportation was considerably interfered with. Jobbing houses in our own city have possibly suffered to the same extent in receiving their goods that their customers suffered in receiving theirs.

Freightage to interior points has, we think, resumed its normal condition.

MERCHANTS can have some idea of the conditions of the railroads when it was made known to them that over 2000 cars were lying blocked in Pittsburgh, and all freight was blocked for several days in order that the blockade might be opened.

The question would naturally arise: Have the railroad facilities and equipments increased with the increased trade during the last few years? If they have not, it looks very much as if there would certainly be trouble during the year 1893, when the travel to the World's Fair will tax the companies beyond anything in our history.

That manufacturers are not overstocked with goods is very evident and is shown by delay in making shipments. The interior merchant will do well not to permit his stock to be reduced to the minimum point, as it is very evident that no large stocks can be depended upon as being in manufacturers' hands during this spring.

Market prices continue steady. Collections are not quite up to anticipations at this writing.

Boston.

BIGELOW & DOWSE.—It is quite the custom for retailers to take their account of stock in January, and their time being occupied with this, they have but little to give to a salesman unless he has something of special interest to offer. As a rule, the retailers are satisfied with the past year's business, and are in better shape to start in the new year than they have been for many years past. There have been but few inducements in the past 12 months to purchase for an advance, and stocks generally are light and dealers are owing less than they have for a long time. Everything looks encouraging for a good trade this spring.

Most of the orders for Window Screens, Screen Doors, Ladders, Mowers and Barbed Wire have been placed. Some orders have been placed for both Wire and Steel-Cut Nails, but the unstable price of Wire and the new list of Steel-Cut Nails has confused the buyer so that he is inclined to delay placing his orders for either until in actual need of the goods, preferring to pay an advance if necessary rather than to run the risk of a further decline. Our Nail market was never more demoralized than it is at present, and, to add to the confusion, the coated Wire Nails are being quoted at as low or a less price per keg than the regular bright Wire Nails.

The new list of Cut Nails does not meet with universal satisfaction, and the trade

are waiting to see what the Western mills will do, and are rather hoping they will adopt the same extras as now used on Wire Nails.

If this is done it will make the comparative price of Cut Nails with that of Wire more intelligible and more markets, and if the Cut Nails can be produced at a less price than Wire, this lower base price will secure orders which the mills are now losing on account of the present higher base price on Cut than on Wire.

Few orders have been taken for Wire Cloth or Poultry Netting—no one seems to care for them; if the manufacturers intended to discourage the sale of their goods by the jobbers, they could not have done so more effectually than they have done by adopting a scale of prices which leaves no margin for handling the goods. The sale of Bicycles promises to be very large this season. Prices are not materially different from those of last year, but many of the old machines have been greatly improved, and some of the new high-grade machines will be great favorites the coming season and will have a large sale.

New Orleans.

A. BALDWIN & Co.—Business in this section has far exceeded our most cheerful anticipations, and it seems as though all the merchants put off purchasing their goods until the last moment. The crowds that are coming in to our carnival are not all bent on pleasure, as there are a great many of them who have come in to buy their spring stock of goods. It has almost assumed the proportions of a boom year, or a year in which purchasers are anxious to get their goods before an advance in price.

On the leading staples prices are very firm, as the demand is much greater than anticipated. A great many merchants in this section depend upon the Ohio River for some of their leading staples, such as Nails and Wire. Owing to the blockades of ice this section has been left very bare of these articles, and the consequence is the price is much firmer.

Louisville.

W. B. BELKNAP & Co.—The opening up of navigation has been the greatest possible relief to this part of the country. The railroads have become so blocked that shipments over them in any direction were most unsatisfactory. Their inability to handle the freight of the country was clearly demonstrated, and we think the managers have some problems presented to them quite worthy of their best efforts at solution.

The ice went out of the river in about as good shape as could be expected, with comparatively little destruction of property.

There is a great demand for goods. A singular thing is that prices on staples and most lines have not responded. At any previous time we should have looked for them to do so.

Manufacturers profess to be full of orders and the slow deliveries would seem to confirm this. Whether all of us have got so thoroughly accustomed to an insignificant margin that we do not know how to ask for a respectable one may be hard to say, but it seems in-

credible that there can be a fair remuneration on the basis of many of the prices now existing.

Some items are especially scarce, Trace Chains, for example. We have never seen the market so bare.

The new Nail Card has not been uniformly accepted; there is talk of a Wheeling meeting, which may suggest still further variations.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—Hardly any change can be expected in the condition of the jobbing Hardware trade of this center until atmospheric influences take a new departure.

The weather has continued cold without any noticeable break. With a little milder weather farmers might visit the towns more freely, and by so doing stimulate to a certain extent the movement of goods. On the other hand, a too radical change in this direction would break up the country roads and keep the farmers at home more effectually perhaps than the cold weather.

In spite, however, of the almost continuous cold weather, which tends to keep people indoors, the volume of business has shown no diminution during the past two weeks. There is a steady demand for almost everything that is seasonable, and the indications promise a largely increased output as the spring season approaches.

Cleveland.

THE W. BINGHAM COMPANY.—The extremely cold and stormy weather that has prevailed hereabout for the past week or more has interfered somewhat with trade, not only with the taking of orders, but with shipping them after they were taken. Many of the railroads diverging from this point have become so blocked, and freight has accumulated so on their hands, that they have absolutely refused to accept any freight. A few days of good weather will soon raise this embargo, and trade will be back in its old channels.

Prices on staples have somewhat stiffened since our last writing, and although the prices of Plain and Barbed Wires have not advanced, they have a much firmer tone. Wire Nails from stock here have advanced 5 cents per keg. The outlook for the spring is excellent, and we are anticipating an unusually large spring's business.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Since our last the weather has generally been quite severe, accompanied by considerable falls of snow over a large part of the Northwest. There is now a large body of snow on the ground, which on the whole is favorable, though it has interfered somewhat with the operations of the railroads, and especially has blockaded the country roads, and has thus interfered with trade and collections.

It is a time of year, however, when we expect only a limited trade, and it is now probable that business will be very moderate until spring is near at hand, which will not be yet for some time. Collections are slower this last year than usual, and it is expected that trade this spring will not equal that of last spring. Jobbers take a

very conservative view of the situation, and are not disposed to push out goods without knowing that they may confidently expect them to be paid for.

Money will not be in so active circulation during the first half of this year as for several years past; still there will be considerable money paid out for grain and stock, as well as large amounts in the lumber and mineral districts, and the returns during the next four months may prove more satisfactory than is now anticipated. At all events there will be considerable money in circulation, and the wants of the country have now grown to be so large that there will be considerable trade, even for so dull a season.

Prices in nearly all lines of Hardware remain satisfactory, and it is not expected that there will be any considerable changes in the near future.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—Since our last we have had another touch of winter. Snow has fallen to the depth of 30 inches and now lies 18 inches on the ground. With our previous storm in December it makes a snowfall unprecedented for this section. Last winter roses were in bloom all the time. This makes the contrast greater. The snowfall, however, should result in our having large crops, as the ground so far has been well protected.

Trade has been interfered with very much by the storm; trains and mails delayed. Dealers do not care to place orders while business is so quiet. Collections are still slow, and all are looking forward to March to bring some relief. Prices are about as they have been heretofore reported.

Notes on Prices.

Cut Nails.—Owing to only partial adoption of the price-list on Cut Nails, there is considerable confusion in the market in regard to quotations, but as a rule prices are named by the mills on the basis of the old card. Local dealers are endeavoring to adhere to the new list, but until it is generally adopted by the mills it is not easy to do this satisfactorily. The question as to the fate of the list depends on the action of the Western mills, who have been conferring in regard to the matter. What their decision will be is still in doubt. Carload lots at mill may be quoted at \$1.40 on a 35-cent average, a figure which is, however, slightly shaded in special cases. Small lots from store in New York are quoted regularly at \$1 off the new list. There has been considerable activity, and the prospect is regarded as very promising for a large demand during the season.

Chicago, by Telegraph.—Manufacturers' agents report a much better business in Cut Steel Nails, with occasional orders running into very respectable quantities. They continue to quote on the basis of \$1.60 on 30-cent average, according to the old card. The discussion of the new card has not terminated in an overwhelming sentiment in its favor, but from present appearances an entirely different card may be adopted by the Western manufacturers who have recently been holding meetings

at Wheeling and Pittsburgh. Small lots from stock sell at \$1.65.

Wire Nails.—The Wire Nail market is certainly in better condition than for some time. Prices are somewhat higher and well maintained on the basis established by the manufacturers at their meeting in Chicago, to which reference was made in our last issue. The market is represented by the quotation of \$1.40 to \$1.45, the former being the lowest manufacturers are willing to name. There is a large movement in this line and manufacturers are busy.

Chicago, by Telegraph.—A much stronger feeling prevails in Wire Nail circles, although buyers are not stepping forward with much alacrity to pay the new price, \$1.57½, Chicago. The trade are waiting to see if it will really be maintained. This is the natural result of failure to keep agreements in the past. Manufacturers, however, appear to be undisturbed, asserting that no signs of weakening are apparent, and that buyers cannot hold out much longer with spring so near at hand. They also claim that indications now favor closer relations than ever among the leading makers. The mills in Northern Ohio are reported to be arranging for a consolidation of the interests. If they unite and a single selling agency controls their vast output the situation will be greatly simplified and reckless competition will be nearing its end. Small lots from stock are unchanged at \$1.60 to \$1.65.

Barb Wire.—The market in Barb Wire is characterized by a somewhat better tone, and some of the extreme prices named by manufacturers have been withdrawn. The quotation of \$2.40 to \$2.45 for Galvanized Four Point at mill, carload lots, represents the market, though some manufacturers refuse to meet these figures. The demand for Barb Wire is setting in more actively and the prospect for a heavy trade is excellent.

Chicago, by Telegraph.—Barb Wire manufacturers are in receipt of an increased number of orders, and the outlook steadily improves. The weather has not been favorable for the Barb Wire trade, but the severity of the winter is now broken and from this time forward orders are expected to flow in with an increasing current until the height of the spring season is reached. Manufacturers report their agreed price of \$2.20 for carload lots of painted well sustained. Jobbers, however, continue to quote from stock at \$2.60 to \$2.65 for Galvanized, with 40¢ off for Painted.

Bright Wire Goods.—At the present time the market in Bright Wire Goods is not characterized by its usual evenness, and there has been something of a break in prices, resulting in considerably lower quotations in some cases.

Tinware.—The market for Tinware is somewhat irregular and the competition between the different manufacturers is animated. The tendency which has existed for some time of quoting net prices instead of per list and discount has developed so far that to all close buyers quotations are

made in net figures. The manufacturers refer to the inconvenience of this method and buyers to the care which is necessary in ordering goods if there is a careful comparison of prices made by competing houses.

Iron Rivets.—The Rivet market is characterized by a good deal of demoralization. Competition between the manufacturers is active and lower prices have been developed during the past week or two.

Tackle Blocks.—The condition of the Tackle Block market is far from satisfactory and the competition has developed exceedingly low prices, and even the small trade are able to purchase at figures which some time ago would not be considered.

Lawn Mowers.—Graham, Passmore & Co., Philadelphia, issue the following discount sheet relating to their line of Mowers:

	Per cent.
All Hand Lawn Mowers, except Style A...	70
Style A, malleable steel Mower.....	60
30 inch Pony Lawn Mowers.....	40
36-inch large Horse Mowers.....	30
Collectors.....	20
Lawn Sweepers, hand or horse sizes.....	30
Extra parts or repairs.....	40

The discount sheet also illustrates their Style A malleable steel Mower, which is listed at \$28 and \$31 for the 17-inch and 19-inch respectively. Their Grass Collector is also shown and the following list prices given:

	Each.
14 and 16 inch.....	\$2.50
17, 18 and 19 inch.....	2.75

Oil Well Cordage.—The dealers in Oil Well Cordage held a meeting in Pittsburgh last week, at which a slight advance in prices was made, and it was mutually agreed that the established price be closely adhered to, which has not been done for some time past. Represented at the meeting were the Oil Well Supply Company, National Cordage Company, Jarecki Mfg. Company, Frick, Lindsay & Co., and Bovard & Seyfang Mfg. Company. The price of Oil Well Cordage heretofore has been 12 cents per pound, but it was decided at the above meeting to advance the price to 12½ cents per pound, and it is claimed this price will be strictly maintained.

Glass.—There have been few developments of interest in the American Glass market during the past week, the attention of the trade having been directed to the new discounts made by the National Window Glass Company, as given in our last issue. Reports from factories indicate that the demand for Glass remains steady, while production is falling off and will continue to be lighter during the next few weeks than it has been. Some factories in the natural gas belt have suffered considerably from shortage of gas, causing pots to go out of operation in some cases. Local trade is fair, and out-of-town business is reported as satisfactory. It is understood that a movement is on foot among New York importers of Window Glass, having in view some definite ar-

rangement to insure the stability of prices. At present the market is in a demoralized condition, and Glass is sold at from 80 and 5 per cent. discount to 80 and 10 per cent. discount. The Plate Glass market is quiet, with limited demand, and no change in quotations. Quotations on Glass are as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; 100 boxes or over, 80 and 10 per cent. discount; less than 100 boxes, 80 and 5 per cent. discount. French Window Glass, 80 per cent. discount to 80 and 10 per cent. discount. American Plate ranges in price from 60 and 2½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

The Hardware Dinner.

ARRANGEMENTS for the hardware dinner next Tuesday evening are about completed. We are advised by the committee that the demand for tickets has exceeded the supply, and a good many persons, many of them connected with leading houses, have been unable to obtain tickets. The success of the dinner in point of numbers is thus assured, and everything would seem to indicate that it will be a thoroughly enjoyable and representative gathering.

Export Notes.

THE FRANCO-CANADIAN treaty, by which imports from Canada will be placed on the minimum schedule of the French tariff, was signed in the French Foreign Office in Paris, February 6. The document will be submitted to the French Chamber of Deputies and Canadian Parliament for ratification.

The returns issued by the London Board of Trade for January, 1893, show the exports decreased £1,112,000 (or about \$5,500,000) as compared with those for the corresponding month a year ago.

C. B. Riker, who makes two trips a year to the West Indies, supervising the export interests of W. E. Peck in that territory, sailed February 11, on the steamer "Britannia," for Havana, and will go to Jamaica from there.

It is doubtless an innovation for a New York merchant importing high grade London goods in Saddlery Hardware, &c., to open a manufacturing establishment of these wares in England, but such an enterprise has recently been attempted by C. C. Bartley of 58 Warren street, this city, at 208 Moseley street, Birmingham, England. While similar goods are carried in stock at the New York warehouse and direct importation orders taken, it being the custom of many American buyers to visit England and the Continent in search of fine goods, the purpose of this venture is to enable such agents to see samples and merchandise

and encourage the placing of orders on the spot where the goods are made.

The importations of American goods into Mexico through Piedras Negras for the month of January, 1893, paid into the Mexican Custom House the sum of \$77,385, an increase of \$4741 over the receipts for January, 1892, approximately an increase of over 6 per cent. Much of these duties were collected on corn and a little on Machinery, corn paying one-quarter of a cent per kilo, or a little over 11 cents a bushel, so as to avoid the full tax of 1 cent per kilo, effective February 1.

A. Hiscock, buyer for M. Monroe, St. John's, Newfoundland, general importer of Hardware, is now in this city in the interest of his house. It may be recalled that this establishment was one of the few which escaped disaster in connection with the recent large fire in that city.

Recent advices from the City of Mexico refer to the continued tightness of the money market, the current bank rate being 10 per cent. Large investments, it is said, are being made by natives and foreigners in coffee plantations, the product of which is in good demand for exportation.

The great floods in Australia, caused by sub-tropical rains, are doing great damage, especially at Brisbane, large sections of the city reported as being inundated. One peculiarity of deluges in portions of that country is the slight grade, so that water falling hundreds of miles off does not attain a rapid current, but makes its way to the coast so moderately that places likely to suffer are often notified by telegraph of the location and position of the advancing column. We were told by a resident who lately completed an eight years' sojourn in that country of a flood that the inhabitants of a town had time to protect themselves against by the building of a five-foot wall, partaking of the nature of a dike, which, owing to a miscalculation, proved to be a foot short, but in the main accomplished the purpose for which it was built.

5000-Mile Tickets.

THE CAUSE of the opposition of the Minneapolis Jobbers' and Manufacturers' Association to the interchangeable 5000-mile ticket is thus stated by a Minneapolis paper:

The Jobbers' and Manufacturers' Association has decided to oppose the issuance of the 5000-mile ticket good over any railroad. One reason for this action is the advantage such an arrangement would give the Chicago traveling man. He could come up into this Northwestern territory easily, and thus could compete with the Minneapolis firms. At present he cannot do this on account of the cost of transportation. To make the more important towns of the State requires that a mileage book on each line of railroad be purchased. Perhaps only 40 or 50 miles will be used in as many days, and the rest is held at a loss. Every railroad in the Western Passenger Association has been notified of the position of the members of the Jobbers' and Manufacturers' Association on the subject.

What the Trade Say About the Price-List for Cut Nails.

WHILE THERE IS SOME UNCERTAINTY as to the extent to which the price-list for Cut Nails will be adopted by manufacturers, there is evidently among the trade at large a difference of opinion as to the advantages of the new scheme. In order to reflect the views of Hardware merchants we give below the substance of advices received from representative houses in different parts of the country in regard to the way in which they regard the new list. It will be seen that opinions are very diverse:

For the past year or two it has been necessary to figure on our specifications to make a price according to the average of extras, which not only involves considerable labor, but makes it difficult to adhere to any established price. We hope the new Nail card will be generally adopted.

We regard the new Nail scheme as extremely weak, and fail to see anything about it to command to the trade. We see no reason for abandoning the old plan, but believe that a new classification is demanded.

We much prefer the old method to the new in selling Nails, and we think both manufacturers and dealers will find that selling Cut Nails by discount is very unsatisfactory.

This is going back to about the same basis as Eastern card in use 25 years ago, which gave one price for all sizes from 4d to 60d and was changed to 10d to 60d base because the Western mills sold in this way. We think the trade are better satisfied to adopt a card that gives all sizes nearly at one price rather than have so many extras.

We find it is criticised by some, but if it is generally adopted we can get used to it. At the present time we cannot say that it is preferable to the old.

In our opinion the new list on Cut Nails is a good one. Certainly as good as the old, and it will probably afford the merchant a chance of making something of a profit.

We prefer the new schedule.

As to the old and new methods of quoting Nails, it appears to us that there is little difference in value. Either is all right if allowed to remain in use so long as to have become familiar to the salesman. The present price-list we consider more equitable than any recently issued, and it will better please the consumers.

We do not regard the new method with much favor, as we deem it too complicated for our country merchants, and consider the old method very satisfactory.

In looking over the list the manufacturers propose to adopt, which is subject to a certain amount of discount, it would

seem that any change in this direction cannot be looked at with favor by the jobber, as it means a different list with which he has to become familiar, as the value of this material has been based on the list that has been in use. It will require considerable figuring to reduce the prices on the various sizes to the former standpoint, as the object in making a new list must be to advance the price of the material.

We can see no change to either the jobber or the manufacturer in the price-list for Cut Nails. As it appears to us the change merely amounts to a difference in method with no chance for additional margin.

We have not adopted the method of selling Nails by the new list as yet, as we were unable to reach our men early enough to make a change. Shall commence on the 13th to sell at the new list. We have no idea as to how the trade will receive it. The jobbing houses we have had correspondence with do not take to it kindly, but in all probability none of us can give an opinion until it has been fairly tried.

We think the new card on Nails much better than the old one, as it does away with the necessity of figuring averages, which so many people do not understand.

To the buyer the method of arriving at a price on Nails is of small importance. To the seller—that is, the clerk—we are inclined to think the new method of a discount off will be a disadvantage. We welcome the return of the old plan of making the base price apply to all sizes from 10d to 60d, and think this the one redeeming feature of the change.

We fail to see the advantage of the new card over the old method of pricing Cut Nails.

We hope the new price-list on Cut Nails will be adopted by the Western manufacturers, not that we are certain that it is exactly right, but because we believe it to be a very great improvement over the old card, which has been for years a constant source of annoyance. We have been patiently waiting for the time when a point could be reached where the figuring of averages in assortments of Nails could be dispensed with, and we believe the new list, if adopted by all and strictly adhered to by manufacturers, will afford certain relief to all parties concerned.

The writer has seen a number of the smaller trade since the new list on Nails went into effect, and it is our belief that it will not prove satisfactory, and that buyers will refuse to purchase as per this arrangement. The result will be, we think, that it will further curtail the use of Cut Nails and promote the sale of Wire Nails.

I do not like the new list. It seems a useless change of system. If we say 10d to 60d is base, and make a price for base sizes, then adopt the new extras, why is not the same result accomplished? That will save educating many thousand men up to the new method. It is simply a new road to an old result. The new road is no straighter, no more simple. Then let us not change simply for the sake of a change and nothing else.

We are advised by W. P. Smith, Knoxville, Tenn., that the new list is received with much favor by the members of the Southern Hardware Jobbers' Association, of which he is secretary, and that they are a unit in its favor and earnestly desire its adoption. It is referred to as far preferable to the old one, especially as with it the manufacturer is enabled to sell a carload of any size of Nails the merchant may desire at a stipulated price irrespective of average. The hope is expressed that every Nail manufacturer in the country will adopt it without delay.

Agricultural Implements in Mexico.

(From a Resident Correspondent.)

WITH MUCH INTEREST the writer read the extract from a late United States Consular Report, published in *The Iron Age* of January 26. In this report it is remarked, and very correctly, that "Mexican merchants have no predilection in favor of European marts," and the consul exclaims with seeming surprise, "and yet there is not a single American commercial house in the district." This latter statement is worthy of notice, more especially because it can be extended, almost literally, to this whole Republic. The number of Americans engaged in mining, stock raising, agriculture and mechanical pursuits in this country is very large, while the number of American merchants is remarkably small. The Hardware business is almost controlled by Germans, and this is partly the cause why the already large amount of American goods sold here is not many times larger.

Almost all these foreign houses contract for their employees in Europe, advancing the funds for bringing them here after having contracted for a term (generally three years) of service at a stipulated annual salary. Naturally, all these employees are more familiar with European goods than with American ones, and the prejudice of each one causes a greater demand for the European articles. American goods in these houses depend altogether on their merits, seldom being pushed by salesmen who in a majority of cases do not even understand English.

It is remarkable how few Americans will learn the Spanish language in a moderate time, whereas all Germans and Frenchmen speak it fluently after having been in this country a year or so. Of course this fact would present a great difficulty to American commercial houses here. It is very true that the Mexicans need education on the subject of farm implements. But it is not the poor one, "who ineffectually turns over his soil with a crooked stick," that needs education. It is the rich "hacendado," the owner of thousands of acres, who alone has the means to purchase the larger implements, and who is, as a rule, very much in favor of old methods. Men are about as cheap as animals, therefore the plows which are used are almost all 6½ inch or 7 inch cut

—a small mule and a small plow in charge of a man of small ability.

For the use of larger implements it is necessary that first the "hacendado" be educated to the advantages of them, and he must then educate the "peones" to the use of them.

Slowly, but surely, this work of education is going on. Unhappily, almost all Spanish literature on trade topics which is printed in the States is of such imperfect character as to be almost unintelligible in the majority of cases.

No doubt the World's Fair this year will do a great work toward making the people in Spanish-American countries acquainted with the "United States of the North," as they are called here.

in which pocket cutlery is displayed, and touches such points as the following :

Whether in show or wall cases and on flat or inclined surfaces;

The kind and style of boxes;

Whether samples and stock are kept together or separate;

Manner of marking prices;

How damaged or broken lots are disposed of;

Suggestions in regard to assortment of qualities and styles, and as to how the sale of the goods may be increased and made profitable.

The following prizes will be awarded :

First prize	\$12.50
Second prize	7.50
Third prize.....	5.00

Replies are to be received not later than March 11, 1893. They should be addressed as follows :

DAVID WILLIAMS,

96-102 Reade street,

New York.

Prize Competition No. 12.

Our weekly Prize Competitions Nos. 1 and 2 are now in the hands of the Committees of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a good deal of practical information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 3. Closing February 18.

Waste in the Store and How to Avoid It.

No. 4. Closing February 25.

Suggestions as to Improvements in Putting up Goods.

No. 5. Closing March 4.

A Method of Securing a Reliable and Prompt Delivery of Goods.

No. 12. Closing March 11.

Arrangement of Pocket Cutlery.

Another subject will be announced in our next issue.

Our readers are also reminded of the following Prize Competitions, announced on another page, in each of which four prizes, of \$50, \$25, \$15 and \$10, are awarded :

No. 6. Closing February 18.

How Retailers Can Best Advertise and Extend Their Business.

No. 7. Closing February 18.

Travelers' Yarns.

No. 8. Closing February 18.

How to Treat Clerks.

No. 9. Closing February 18.

Shop System of Keeping Track of Jobs.

No. 10. Closing February 18.

Business Maxims—At Least 10.

No. 11. Closing February 18.

How Small Retailers May Keep a Record of Prices.

The San Francisco *Call*, in reviewing the progress of the beet-sugar industry on the Pacific Slope, says that in the year just ended the total amount of refined sugar made in the State amounted to nearly 23,000,000 pounds, as against 8,000,000 for the preceding season.

Prize Competition No. 12.

SUBJECT :

Arrangement of Pocket Cutlery.

This competition is intended to call out practical suggestions in regard to the way

Trade in Builders' Hardware.

IN THE FOLLOWING LETTER from a Hardwareman in Ohio some practical suggestions are made with reference to advisable methods of handling the trade in Builders' Hardware, especially in bidding on architects' specifications, &c.

The subject of Builders' Hardware is suggested by the near approach of the building season, when such material will be in active demand. The topic as a whole is entirely too broad to admit of treatment in its various phases in one article, but the one which is of most general interest to Hardwaremen just now is that of supplying builders and contractors. With many dealers this trade is one of the most important branches of their business, and where properly handled and competition is not too keen a very profitable part of it.

DIFFERENCE IN LOCATION.

As a matter of course, the desirability of handling this business is modified by local causes to a large extent. The demand being almost entirely governed by the degree of activity manifested in the building trade, it naturally follows that it is more important in the cities, and more attention is devoted to it there than in the rural districts, where it gives way to such lines as Agricultural Implements, &c. However, the close competition which usually exists in the cities reduces the profits to such an extent that the advantage over the country trade, with less sales but larger percentage of profit, is not so great as appears on first consideration. Then the city trade demands a greater variety and more complete line than the average country trade, and the dealer finds it necessary to invest more money than is necessary for the same stock in a country store. There is no comparison between the two when it comes to competition. It has reached the point now in the cities where nearly all orders for Builders' Hardware from \$25 and upward are submitted to the competition of two or more dealers, which has the natural tendency to reduce profits to the minimum. "Competition is the life of trade," so they say, and to a certain extent it is really beneficial, but in many localities it is particularly keen on Builders' Hardware.

DEMORALIZATION IN THIS LINE.

The fact that so many houses take special interest in this line and make a distinct department of it is responsible for this, to a certain extent. The ambition of the salesmen and their knowledge of the fact that there will be other bids submitted on the same job frequently lead them to make unnecessarily low prices. In some instances I have known of goods being sold below cost. There certainly is no profit in business under such conditions, and no necessity for it. The folly is made the more apparent when we consider the risks generally assumed in handling this class of trade. The building business is greatly demoralized in many localities, being overrun by scores of con-

tractors, many of whom are irresponsible as to credit and character, who nevertheless come into competition with reputable and responsible dealers, who conduct business in a legitimate manner. This competition so materially affects the building business that the Hardwareman necessarily suffers from sympathy. Consequently, the Builders' Hardware business is not nearly so profitable as it was in the "good old days" when the contractors all made large profits and were willing to pay a fair margin to the Hardware dealer.

DETERIORATION IN QUALITY.

This competition has not only had the effect of forcing down prices to a very low point, but the quality of the goods has likewise been affected, especially of those used in a class of houses costing from \$1000 to \$3000. For example, nearly all architects' specifications require inside Locks to be of brass, with brass faces, strike and bolts; now, a few years ago, when Locks of this kind cost from \$5 to \$6 per dozen, this was sufficient to insure the use of a good Lock; whereas to-day, to satisfy the urgent demand of the dealers for a cheaper Lock, to meet competition, the various manufacturers produce Locks which in letter comply with the requirements of the specifications, that may be sold as low as \$2 per dozen. Necessarily the cut is mostly in quality.

A POSSIBLE REMEDY.

It may be inferred from what I have previously written that I consider all contractors rascals, and that it is my intention to reflect on all of them. Such is not the case by any means, and I do not so wish to be understood. The trouble is, there are so many who are disreputable that the responsible and respectable ones have to suffer for their sins to a certain extent.

It has about reached the point where the only salvation for the dealer who must have a better margin of profit and the client who wants a better class of Hardware lies in taking it out of the contractors' hands and either making the selection himself or leaving it to his architect. If the latter plan is adopted, there are still difficulties to contend with, since many architects are prejudiced in favor of a certain line or firm and will divert orders to them, sometimes against the interest of the clients. The prejudice may be merely the result of belief in the superiority of the goods, but it is also in many cases the direct result of a private commission from the favored manufacturer or dealer. I have in mind at present at least two articles the remarkable sale of which may be almost entirely attributed to these special "favors."

UNSATISFACTORY GOODS.

This builders' trade is handled in the city somewhat differently from the country. The schedule quoted on by the city dealer usually comprises only the actual "trim," in some instances Nails and Screws being included; in the country, these are not only included, but Sash, Doors, Blinds, Glass, Putty, Paints, &c., are also often figured in. The custom of naming a lump sum for the entire lot, generally adopted in the cities, is not

usually followed by the country trade; in fact, in some localities such matters as bids on contracts of this kind are almost unknown, the builder or owner buying his Nails, Screws, Locks, &c., as required from time to time.

Perhaps the most undesirable customers in this line are these contractors or real estate men who erect from three to fifty "cheap John" houses to be sold on the installment plan. The material is usually of a cheap, showy class, and is not only unsatisfactory to sell, but very low prices have to be made; furthermore, these fellows are usually heavily encumbered, and it is often necessary to take their paper in payment.

With the exception of houses of this description, most buildings, residences especially, are now contracted for exclusive of the Hardware. As explained before, this is usually advantageous to the owner, as it leaves the selection entirely with himself or his architect. It is also better for the dealer, since a better class of material is generally purchased, on which larger profits may be obtained.

ARTISTIC SELECTIONS.

In this connection it is fitting to note the great advancement in the quality and style of Hardware used in the better class of buildings now being erected. The people have come to realize the importance of having trimmings to correspond with the other features of the house, and now one seldom sees—what was once too common—an elegantly finished house in every particular except the Hardware. The plain, heavy, somewhat cumbersome patterns have been displaced to a large extent by new styles, at once substantial and pleasing—in fact, real works of art. However, the great number of cheap houses being built everywhere creates a large demand for cheap imitation goods. A sensible way to handle this class of goods is in the form of the cheap sets now made by nearly every manufacturer, as it saves an endless amount of confusion and labor.

Many merchants make the mistake of trying to carry a full line of goods in the different finishes. This not only invests too much capital in slow-selling stock, but it is next to impossible to carry such an assortment as will meet all demands. Tastes are so different, and the combinations of goods and finishes so numerous, that it is better to have a few articles merely of the leading finishes for samples, and order the goods from the jobber or factory when required. The interest on the money required to carry a full stock will pay all the express charges several times over.

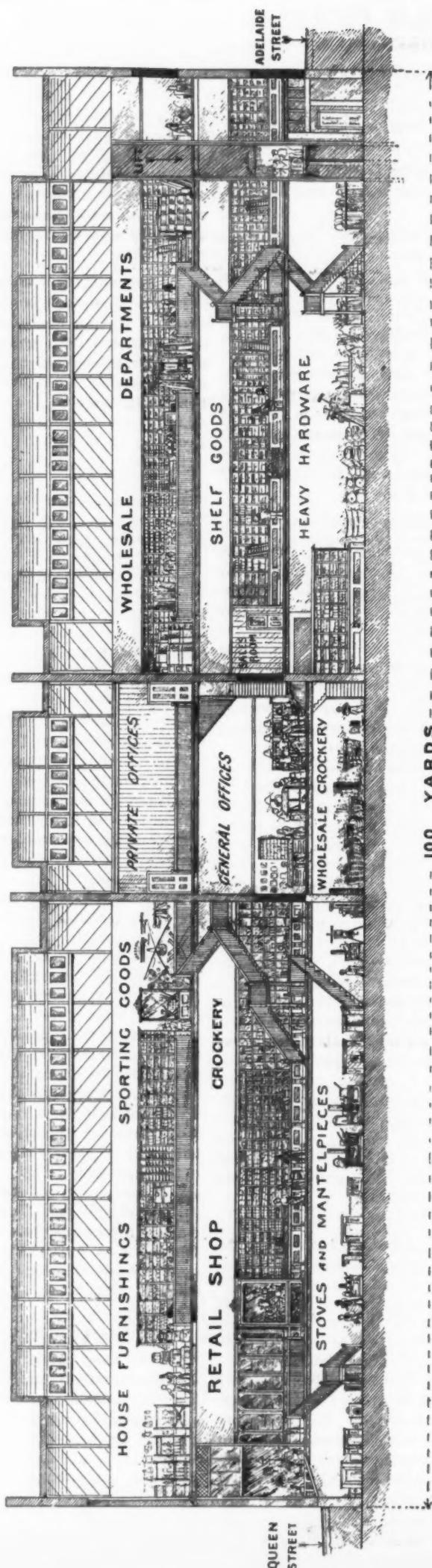
THE DISCREET DEALER.

Properly managed the Builders' Hardware stock may be made a profitable and important part of the business, but unless it is so managed it will be a source of annoyance and loss. A dealer in taking up this line should remember that it is absolutely necessary to keep abreast of the times and supply such goods as are suitable for his locality. It is a hard matter to educate the consumer, and any attempt of this kind is likely to end disastrously with a lot of unsalable goods as reminders of the experience. It is better to find out what the trade wants and get it, but do not get a line and endeavor to make your trade want it.

An Australian Hardware Establishment.

IN THE ILLUSTRATION herewith given we present a view of the interior of Alfred Shaw & Co.'s extensive Hardware establishment at Brisbane, Queensland. As indicated in the engraving, the building is 300 feet long, running from Queen street to Adelaide street. It has an L at about the center which is over 100 feet in length. A short distance away is a large Implement and bulk store, besides several acres of sheds and buildings where the firm's stock of Agricultural Machines, Metals, &c., is carried. As is true with most Australian Hardware houses, Alfred Shaw & Co. carry quite a line of Crockery and Lamps in addition to the regular Hardware and related lines. We are advised that they purchase about 20 per cent. of their Hardware from the United States, and are, in fact, referred to by competitors as an American house because of their seeming preference for this country's goods. They are large buyers of American Agricultural Machinery and Tools, and are agents for a leading manufacturing concern in the States on these goods. They have lately opened a Sporting-Goods department, and have imported from the United States Fishing Tackle, Bicycle Sundries, &c. The purchases from America would represent a higher percentage of the total purchases were it not for the fact that the heavier lines are all purchased from the old country, such lines including Galvanized Iron, Bar Iron, Horseshoes, &c. Alfred Shaw & Co. do a large retail business, as well as the heaviest wholesale trade in their territory. Being so far from the markets, they have to carry an exceptionally large stock of goods, and they state that if they turn their stock once and a half in a year they are doing very well. As an illustration of the early character of their purchases we may say that they are now ordering the goods which will be in demand next Christmas. The firm were organized in 1875, and by judicious enterprise and well-expended energy have increased their business from year to year until they are now doing the largest Hardware business in Queensland, and carry regularly a stock the value of which is estimated at \$500,000.

PATTERSON & HARRAL, for 20 years at 87 Walker street, New York, and the immediate vicinity, have recently leased and are now in the possession of the premises so long occupied by the old house of Quackenbush, Townsend & Co., at 85 Chambers street and 67 Reade street, running through the entire block. This firm are large dealers in specialties and job lots of Hardware and Cutlery, their trade being largely West. This business was founded soon after the collapse of the well-known firm of Day & Halsey, who were bankrupted in the panic of 1873, S. S. Patterson at that time being in their employ. Since then they have occupied the store vacated by Day & Halsey in Canal near Centre street, or near by. Realizing that many of their customers often have but little time to spare when in the city and that their location was out of the Hardware district, they have at last done what has long been contemplated. They are always in the market for large lots of desirable merchandise which for any reason must be realized on quickly. They refer to trade as good and prospects as excellent.



An Australian Hardware Establishment.—Alfred Shaw & Company.

Hardware as Specified.

THIS TERM COVERS "a multitude of sins," as it is almost universally used by the architect in making up the plans for buildings. It is all right that such an expression be used and the specifications may make the work of estimating an easy task easier. The trouble lies in the fact that while the specifications are quite explicit as regards the wood work, the masonry, &c., in all probability a page will be devoted to Hardware and will read something after this manner:

HARDWARE SPECIFIED.

"Hardware to be of good quality"—that's definite—"and bronze on first and second floor; attic to be trimmed with rim locks and jet knobs; front and vestibule doors to be supplied with first-quality interchangeable-key locks"—each maker has a first-quality lock. The balance of the page in reference to Hardware is devoted to sash pulleys, shutter butts, window fasts and other minor details, but never a word to enlighten one as to the grade, style or quality of goods to be used throughout the house. It therefore rests with the estimating party to decide what is right and proper for general application where no rules are laid down; and with this state of affairs, the floor plans and elevations before us, we will take the place of the estimating clerk and start in to trim.

THE BASEMENT.

According to the plans, there is an entrance door leading to the street. Obviously this door must have a good lock, and if the best lock is used on the main entrance, then this lock should be equally secure. To this door we will apply a mortise flat-key vestibule latch. In all probability there will be an iron gate used outside, but it does not show on plans. Specifications do not say. Now there is the back door leading to the yard. This door does not need so expensive a lock as the front one, but we will use a three-tumbler 5-inch mortise bit-key lock here, bronze knob outside and black iron inside, and a combined escutcheon plate outside, as we did on the front-door lock. Left to our own decision, we will use 5 x 5 butts, solid bronze, for these two doors, and the remaining basement doors we will trim with 4 x 4 iron butts. We take it for granted that the doors are light, and that base-board molding is very thin. As for locks for the other doors, 4-inch mortise key plates and plain knobs should be the proper trimming. But here is the pantry door: what shall we put on this door? Must it be secure? Off we go again in the dark and trim the pantry with a flat-key dead bolt, a pair of knobs operating a spring latch. Our competing neighbor may use a cheap mortise lock. At this point we are again brought to a halt, and try and solve the question as to whether the cupboard doors are rabbeted or plain, as it makes quite a difference in the cost, but to be on the safe side we will use rabbeted locks. In the laundry the washtubs need butts and lifts, but we will leave that

for the carpenter to trim, as well as seat in toilet. The toilet door we will trim with spring latch and small dead bolt operated on inside by thumb piece. The windows we will trim with a cheap fast and hook lifts, as cup lifts are not made for use in the case where servants with wet hands need to lift a window. The dumb waiter to butler's pantry we will also trim with hook lift, for the reason given before. Having finished the basement, we turn the plans and start the work on

FIRST FLOOR.

The main entrance door is the first to receive attention and we supply our best front-door locks, 5½ x 5½, or 6 x 6 butts, keys to pass front and vestibule locks, as this for a wonder was mentioned in specification, but at this point we stop. How about the escutcheon, hinge plates, dummy trimming, push button, &c., &c.?

We solve this problem, but in a very unsatisfactory way, by simply trimming the active doors in plain bronze or brass, and trust that we can adjust the other matter, provided we get the order. It is not safe to estimate \$50 for front and vestibule trimming, while our competitor uses plain bronze and as little of that as possible. Of course we might have asked the architect about this—that is not the point—we might ask about 50 other details which should all be explained in the specifications. The doors from main door to parlor, to library, to dining room, are all double sliding doors—are they to be hung overhead or to have brass sheaves and way? The most approved style is to hang them, so we'll use hangers, and as we do not know whether locks are wanted or only pulls, we use the locks to be again on the safe side.

From the plans it is impossible to tell whether butler's pantry door is double or single acting—how easy it would have been for the designer to have shown this by using his compass and indicated, so all might read, by means of a half or quarter circle? We will run the risk and use a double-acting butt, even if it does increase the amount \$10. We finish the rest of the floor in the regulation way, as the minor trimmings do not signify much one way or the other, except for those windows to the porch. Are they rabbeted or plain? Again we overlook the cost and use the figure for rabbeted locks, and trust the other man will do the same. Cupboards, closets, &c., we trim in regulation style, and again turn the plans to the

SECOND FLOOR.

The specifications said bronze here, so we will proceed to trim the chamber doors with 4½ inch mortise locks, 4½ x 4½ loose-pin butts, combined escutcheon plates and plain bronze knobs. On the closets we will modify the trim by using escutcheons on outside only. For the bathroom we will use a lock similar to the other door locks, but add a dead bolt and thumb piece for inside operation. We cannot tell from plans whether the square window in bath is hinged, pivoted or lift; we will suppose it is pivoted, and furnish pivots and

an adjuster, say 12 inches in length. From the plans we imagine that inside blinds are to be used; accordingly, we furnish butts, flaps and shutter bars throughout. If we are mis'aken in this supposition, then we have increased our figures to such an amount that our chances for success in getting the order are very slim, as small butts and flaps are very expensive. Trimming the windows on this floor is very simple, only an ordinary fast and flush or cup lifts, two of the latter to each window. Having finished this floor, we now turn to plan of

ATTIC.

Rim locks, jet knobs, and properly black iron butts here; butts 4 x 4, and small key plates black iron, or more properly speaking, Bower-Barff. All the closets we will trim the same as the chamber doors, except we will use half pairs of knobs. The lumber-room door we will trim as we do the other doors, but will add a flat-key dead lock, as this door may require security. Lastly we trim the hatch to roof with a pair of 3 x 3 butts, a hook and staple and a scuttle chain. This completes the trimming all but a few small pieces; these being closet hooks, door stops, &c. We now check back our work to be sure that nothing has been omitted, and finding we are right we proceed to figure up the amount. A glance over the work convinces us that it would be impossible to cheapen the trimming in any way and have the house trimmed as it should be; therefore, when we find the amount to be, say, for example, \$540, we feel confident that we are right. We send the plans to the architect, and by mail inform him of the amount as found.

THE RESULT

is that we get no reply and never hear of the matter again until, by chance, in passing, a call is made on the designer, and in answer to the question as to what disposition was made of the "Doe Residence," he replies, with a smile, "Why, we gave the order to Lox & Nobs; they were over \$100 less than you." Here we are curious to find out what sort of trimming is being used that cost \$100 less than the trim we would have used, and just for satisfaction sake we run to the town, nearby, and look over the residence. They are not using a butt in the house that is over 4 x 4, except on front door; they are using one-tumbler locks all alike; there is not a door or window rabbeted, nor a piece of ornamental trimming being used. The successful party has used the cheapest, meanest kind of Hardware. The owner is pleased at the small cost. Will he be pleased with the wear and appearance after a year has passed? Would it not be better if the architect were more explicit in his specifications, thereby giving each one estimating a fair chance? Would it not tend to freeze out that class of tenement house Hardware manufacturers who are a constant drawback to reputable houses whose names are synonymous with high-class goods. The firm that always get the order because their estimate is lower than their competitors' and the architect who always gives the work to the lowest bidder, irrespective of quality, together do a great injury to the owner, to the trade and to the general advance of art in this direction.

Trade Items.

SURPLESS, DUNN & ALDER, 97 Chambers street, New York, have been appointed agents for the manufacturers of Covert's Saddlery Works, Farmer, N. Y.

THE AIKENHEAD HARDWARE COMPANY have purchased the Hardware business of Aikenhead & Crombie, Toronto, Ont., and will continue it at the old stand, 6 Adelaide street, east. Alterations in these premises are, however, contemplated which will make them one of the most complete Hardware establishments in the Dominion. The business to which the Aikenhead Hardware Company have succeeded is one of the oldest and best known in Canada, having been established in 1830 by Ridout Bros., who were succeeded by Aikenhead & Crombie. The house will be under the efficient charge of Thomas E. Aikenhead as manager, Mr. Aikenhead having been connected with the business for over 20 years.

THE COPARTNERSHIP heretofore existing under the firm name of Beals & Brown, Buffalo, N. Y., was dissolved February 1, owing to the decease of Mr. Brown and the expiration of the time limited by the articles of copartnership. The business of the firm will be settled by Edward P. Beals. Edward P. Beals, Pascal P. Beals and William R. Gass have formed a copartnership under the style of Beals & Co., for the purpose of carrying on the above business as successors to Beals & Brown. They have purchased the entire stock of goods formerly carried by Beals & Brown and will conduct business at the old stand.

THE TRIMONT MFG. COMPANY, Roxbury, Mass., are much pleased with the success their Trimont A Plumbers' Wrench has met with in the past three or four years at the hands of dealers and users, among the latter being the New York Steam Heating Company, who, we are informed, find it especially adapted to their requirements. Some of the features of this tool are referred to by the makers as follows: That it is drop-forged from bar steel and all parts interchangeable. Grips the pipe firmly without lost motion, and will not lock upon the pipe, but in reversing releases its hold instantly. They allude to the demand as increasing both for domestic and foreign consumption. The Trimont Chain Pipe and Basin Wrenches are also manufactured by this company.

UNITED STATES GUTTA PERCHA PAINT COMPANY, Providence, R. I., are putting on the market a paint designated by the letters A. B. C., which represent the full title, which is, Architects', Builders' and Consumers' Prepared Paint. This paint is put up in gallon, half gallon, quart, pint and half pint packages, which are labeled handsomely. This line is specially designed for the Hardware trade, and makes very attractive shelf stock. The manufacturers are sending out sample cards to the trade, which may be had on application.

HOWARTH REVERSIBLE SASH & SASH CENTER COMPANY, Detroit, Mich., are manufacturing Sash Centers, which are designed to do away with the use of box frames, weights, cords, pulleys, spring balances, parting strips, inside and outside tops. The Centers are adapted for residences, public buildings, factories, &c.; and old windows may be adapted to the Centers, when in good condition. The advantages of this system of hanging sash are more fully set forth in their advertisement in this issue.

THE EUSTIS MFG. COMPANY, Bayonne, N. J., issue a circular announcing that the Bronson Supply Company, Cleveland, Ohio, and 72 Beekman street, New York, have been appointed sole selling agents in the United States and Canada for the Puritan House-furnishing specialties manufactured by them. They suggest

that all orders and communications relating to these specialties be sent to the Bronson Supply Company, and hope that this business change will facilitate the execution of orders and be a convenience to their customers.

BOHLKE LEUERSSEN, for the past 23 years with Sargent & Co., in New York, has recently connected himself with the Reading Hardware Company at Reading, Pa. His duties with the new concern will be in the line of catalogue work, in which he has had much experience, and it is expected he will prove a desirable acquisition in this department.

HATCH CUTLERY COMPANY, South Milwaukee, Wis., New York office, 97 Chambers street, New York, David Eastman, agent, have succeeded the Chicago Drop Forge & Foundry Company, Kensington, Ill., and will hereafter manufacture the latter company's Solid Steel Forged Shears.

THE CAPEWELL HORSE NAIL COMPANY, Hartford, Conn., in a circular to the trade, call attention to the points of excellence of the Capewell Nails. The manufacturers claim that their Nails never crimp, even in driving in the hardest hoof; that they are smooth in finish from head to point; that they are uniform in length, breadth and thickness; that they never split in driving; that they never break under the heads; and that they are made from the best Swedish Iron Rods, the quality of which is improved in compactness, tenacity and uniformity of temper by a process controlled by the company. The company suggest that the holding qualities of their Nails be tested by shoeing a horse on one side with their Nails and on the other side with other Nails.

THE RECENTLY ORGANIZED firm of Cavanagh & Thompson, dealers in Cordage, Brushes, Brooms, Earthenware, Glassware, Woodenware and other lines of house-furnishing goods are now fairly established in their quarters at the intersection of Reade and Hudson streets, New York, where they are always pleased to welcome their friends. They refer to business as satisfactory and promising well.

S. A. HAINES COMPANY, Indianapolis, Ind., have made an arrangement by which they have the exclusive sale of Atkins' patent needle point saw, which is manufactured by E. C. Atkins & Co. of that city. This saw possesses special features of construction, and claims are made for its exceptional cutting qualities.

WASHBURN & MOEN MFG. COMPANY announce that in accordance with a mutual agreement between themselves and H. B. Sanborn, the latter retires from the management of their warehouse in Houston, Texas, and their business in that State, and has been succeeded as agent by George A. Cragin, who has been for several years in charge of the company's business upon the Pacific coast.

JOHN M. WADDEL, Greenfield, Ohio, issues a circular in which he announces his withdrawal from the John M. Waddel Mfg. Company as secretary and manager, and states that he is now equipping a new manufactory with the latest improved machinery, to be known as the Waddel Wooden Ware Works. It is expected that the new firm will be ready to market its goods not later than April 1. A full and complete line of Cash Registers, Money Drawers, Coffee and Spice Mills, Animal Traps, Toys and novelties will be manufactured. It is stated that new ideas and artistic designs will be introduced in Coffee Mills, and that all goods, in fact, will be made from patterns but recently designed.

AN ENTERTAINMENT, hop and reunion will be given by the Philadelphia Hardware Association on Thursday evening, February 23, at 8 o'clock, at Young Maennerchor Hall, corner Sixth and Vine

streets, Philadelphia. A very entertaining programme, including accomplished talent, has been prepared, and several well-known speakers will make addresses. In addition an excellent orchestra has been engaged to discourse music. The association are hoping for a large and representative attendance of the Hardware interests of the city. The entertainment is in charge of the following committee: H. L. Stortz, E. H. Shannon, L. C. Glading and S. S. Raser.

AN ATTRACTIVE DISPLAY of Steel Butts for doors, made by the Stanley Works, New Britain, Conn., is made in a pamphlet suggesting reasons why architects should specify, and builders use these goods. Loose-Pin Ball-Tipped Steel Butts, both plain and corrugated, are furnished in light and dark bronze, brass, several shades of old copper, oxidized copper, oxidized silver, old brass, Bower-Barff, &c., by their process of electro-plating. They can, in fact, be made to match any finish of Hardware desired. The corrugations about the joint of the Butt are referred to as largely increasing the strength, at the same time adding to its appearance; and the manufacturers call attention to the fact that the cold rolling of the steel used in these goods increases its tenacity, resistance to transverse stress and elastic limit.

S. O. CUMMINS of Bellaire, Ohio, advises us that he is putting in the show window of his Hardware store a plate-glass front, 10 x 15 feet in dimensions, with mirrors at sides. Mr. Cummins refers to this as the largest plate-glass front in the city.

Louisville Trade.

(From a Special Correspondent.)

THE HARDWARE DEALERS of Louisville, Ky., are not complaining at the volume of business. The only fault to be found is that prices have settled so low. Collections are fair, and with quick returns the money can be used over and often. There never has been, perhaps, a better winter so far than this, in respect to winter hauling of produce. There has been a very light rainfall, consequently the ground is not wet, and the long cold spell kept the roads hard, enabling easy hauling of timber to the mills and lumber to the railroads. The rivers are again open to navigation and the railroads are much relieved of over-pressure. Through the country every one feels that the worst of winter is over, and the farmers are ready to put in early crops.

The recent extreme prices ruling on Barb Wire have caused heavy shipments from store, and as the prospects for such improvements are good, the demands will be kept up. The consumers are well enough satisfied with cost to them; in fact, the retailer is also, and it is only the kindness of the jobbers, who vie with one another in making low figures, that ever makes the self-satisfied country merchant desire continued concessions. But then the jobbers have this trait imparted to them from the manufacturers.

Most of the mills have withdrawn the extreme prices lately ruling. There is considerable talk of higher values for Wire Nails, some mills who usually fight for this territory holding back, seeming content to let others dispose of their product at present ruinous rates, when they will step in and get the cream. Perhaps, however, they will find the milk all skimmed. Cut Nails are suffering from a rapid decline, although large quantities are still going South and West. Building is commencing much earlier this year than usual, frame work being carried on through the winter. Large shipments of Corrugated Iron betoken great improvements under way. General blacksmith supplies are being called for in good orders, and all goods used in the preparation of the soil, such as Plows, Harrows, Cultivators, Chains, &c., comprise the bulk of most orders.

It Is Reported—

That the Fort Collins Hardware Company, Denver, Col., have been incorporated. The capital is \$17,000. The directors are T. W. Valentine, T. H. Davy and Caroline A. Davy.

That W. W. Storm, Oklahoma City, Ok. Ter., will remove his Hardware stock to a new store, where larger and more commodious facilities will be secured.

That Henry Dierdorff of Franklin Grove, Ill., has purchased an interest in a Hardware store at Yale, Iowa, and will identify himself with the business on March 1.

That the Warren Hardware Company, Warren, Ohio, recently held their annual meeting, at which the following directors were chosen for the ensuing year: H. C. Christy, H. C. Bradley, Isaac Kirk, John C. Shook, F. E. Caldwell, W. D. Packard, W. DeP. Knowlton, Wm. Wallace and W. S. Kernahan.

That A. H. Hogendobler has purchased the Hardware stock of J. H. Barkman, Osborn, Ohio.

That Eugene McElwaine has removed his Hardware and Oil Well Supply business from the Bradford Oil Exchange Building, Bradford, Pa., to 135 Main street.

That Edward N. Falke has retired from the Hardware firm of S. A. Conrad & Co., Massillon, Ohio.

That the Hardware store of Pringle & Clunis, Guelph, Ont., was entirely destroyed by fire, resulting from explosion, on the 5th inst. Loss, \$10,000. Insurance, \$8000.

That Connelly Bros. of Norfolk, Neb., are about to open a Hardware store at Lindsay, Neb.

That Henry Stewart of Delevan, Ill., is about to open a Hardware store at San José.

That J. P. Key & Co. of Round Rock, Texas, have been succeeded in the Hardware business by J. F. Nelson & Co.

That the Hardware store of N. D. McClure, Vanderbilt, Pa., was robbed on the 27th ult., and \$75 worth of Razors, Tools, &c., stolen.

That Howard S. Winegar is now conducting the Hardware business formerly carried on by Winegar & Fowler, South Butler, N. Y.

That fire broke out in C. J. Bigelow & Co.'s Hardware store, Dundee, N. Y., on the 30th ult., but was extinguished before any serious damage was done.

That Geo. O. Smith has purchased Mr. Small's interest in the Hardware firm of Duff & Small, Caribou, Maine, and the new firm will be known as Duff & Smith.

That Lew Bright and John Duncan are contemplating opening a Hardware store at Salineville, Ohio.

That Jacob Kalb has purchased the Tinsmithing department of D. H. Neiman's business. Mr. Neiman will continue the retailing of Hardware.

That Tillotson Bros., Hardware merchants, Earlville, N. Y., owing to the large increase in their business, are erecting a storehouse in the rear of their establishment.

That John Stoskopf, Hardware merchant, Freeport, Ill., has disposed of his business to August Brockman.

That L. G. Alworth and R. W. Fisher have engaged in the Hardware and Implement business at Flat Rock, Ind.

That the Hardware and furniture store of A. W. Stone, Bird Island, Minn., has been destroyed by fire, involving a loss of \$12,500.

That the new Hardware firm of W. M. Humphries & Son, Mesquite, Texas, have opened their store.

Price-Lists, Circulars, &c.

SERCOMBE-BOLTE MFG. COMPANY, Milwaukee, Wis., arrange pictures on the lucky four-leaved clover, as a heading to their 1893 calendar. The office is represented by P. H. Sercombe, the factory by F. H. Bolte, the road by F. S. Fox, and the track by W. C. Sanger. The pictures are well executed, and the idea finely carried out. Attention is directed to Telegram Cycles and Sanger Racers, of which they are the makers. Below are date sheets attached.

CHAMPION SAFETY LOCK COMPANY, Cleveland, Ohio: Champion Sash Locks and Champion Spoke Shave. Their 1893 catalogue calls attention to their complete line of Sash Locks, including the Champion Meeting Rail in four sizes, the Champion Side Lock in two sizes, and the Champion Mortise Lock. These Locks are made in all the popular finishes, and in any special finish desired. The Champion Spoke Shave has a blade easily adjusted to cut fine or coarse. It will cut on a flat surface, and can be quickly reversed so as to cut on a small curve.

E. E. SOUTHER & BRO., St. Louis: Roofing. An 1893 catalogue is devoted to the Roofing department of their business, and contains illustrations and descriptions of numerous forms and styles of Corrugated Iron and Steel Sheets, for roofing, siding and ceiling; for inside and outside work, and Pressed Standing-Seam, v-Crimped and Roll Cap Roofing, Gutters, Corrugated Down Spouts and Pressed-Steel Brick.

E. S. & F. BATEMAN, Grenloch, N. J.: The Iron Age Farm and Garden Implements. Illustrations, descriptions and prices are given of Horse Hoes, Adjustable Weeder, Corn Coverers, Harrow and Cultivator combined, Riding Cultivator, Gang Plows, Seed Drills, Hand Garden Wheel Hoes, Barrel Truck and Hand Cart combined, &c. The manufacturers emphasize the fact that it pays to use only first-class tools.

PENNSYLVANIA WIRE WORKS, Philadelphia, Pa., Edward Darby & Sons: Brass and Japanned Bird Cages, &c. Their illustrated catalogue for 1893 shows Bird and Animal Cages in great variety, for which beauty and durability is claimed by the manufacturers.

RICHARDI & BECHTOLD, Bellaire, Mich.: Wooden Ware. Illustrations are given of Wood Scoops, Chopping Trays, Vinegar Measures, Butter Molds, Butter Ladles, Kraut Forks, Rolling Pins, Pickle Dipper, Steak Maul, Potato Mashers, Clothes Pounders, Medicine Cabinets, Folding Tables, Salt Boxes, &c. They have made special efforts to add to their line of Butter Molds, and now offer a complete line. They have also made important additions to their line of Bakers' and Dairy utensils.

C. C. BARTLEY, 58 Warren street, New York, manufacturer and importer of fine Saddlery Hardware: A descriptive price-list which represents a full line of materials needed by saddle and harness makers. The goods are classified in sections as follows: A, Riding Bits; B, Harness Mountings, C, Saddlery Hardware; D, Weymouth Bridles; E Ladies' and Gentlemen's Saddles; F, Halters and Head Collars; G, Saddlers' Woolens and Webbing; H, English Driving Whips; I, Stable Requisites and Preparations; J, Driving Gloves, Coats, Rosettes, Pad Hamings and Sundries.

THE KEYSTONE MFG. COMPANY, Buffalo, N. Y.: Nonpareil Ratchet Wrenches and

combinations. The Wrenches have bit socket attachments, and are easily and readily adjusted and controlled. The Wrenches may be made reversible instantly, without being removed from the work, simply by throwing over the lever in the slot of the handle. The tools are well constructed, highly polished and nickel-plated throughout.

THE ANSONIA CLOCK COMPANY, 11-19 Cliff street, New York: Clocks. A catalogue and price-list of their extensive line of Clocks, Bronzes and art goods fully illustrates their line. It is prepared for both domestic and export trade. The book has 167 pages, 15 1/2 x 12 1/2 inches in size. A feature of the volume is their line of Onyx Clocks and Candelabra, which is printed in color. A new departure has been made in giving the list prices in addition to dimensions under each illustration instead of separately, as heretofore, thereby saving much time in determining the list price of an article.

BLAIR MFG. COMPANY, Springfield, Mass.: Lawn Implements. Circulars illustrating the new Model Easy, Hercules, Bay State, Standard Open Wiper and Leader Hand-Power Lawn Mowers, Archimedian Horse-Power Lawn Mower, Lawn Atomizer, Revolving Turf Edger, and the Hammock Pattern Grass Collector.

E. BEMENT & SONS, Lansing, Mich.: Implements for the farm and garden. Their 1893 catalogue illustrates Plows, Stocks, Cultivators, Harrows, Corn Planters, Man-Power Cultivators, Hand Drills, Cultivator and Shovel Blades, Drill Points, Sweeps, &c. A supplementary catalogue is issued of Farm Implements for export, with New York office at 69 Beekman street; The Wm. C. Barker Co., agents.

E. M. RICHARDSON, Waltham, Mass.: Shedd's steel spring wire Blind Fasteners. A circular to the trade calls attention to the genuine Shedd Fastener and to the fact that they are now offered at greatly reduced prices. An illustrated circular shows the Fastener and catches which are necessary to make it complete.

THE ST. LOUIS REFRIGERATOR & WOODEN GUTTER COMPANY, St. Louis, Mo.: Centennial Refrigerators, Cedar Chests, Wardrobes, Kitchen Safes, Washstands, Tables, &c. In addition to these goods, which are mentioned in a catalogue devoted to this line, the company call attention to Baby Carriages, Safety Bicycles, Iron Wagons, Velocipedes, Tricycles, Wood Wagons, Toy Furniture and a full line of Toy Goods, which they state they are headquarters for.

FOLDING BATH TUB COMPANY, Marshall, Mich.: Combination Folding Bathtubs and Sanitary Bath Chairs. The combination Folding Bathtub is made with the improved bath heater attached and requires less than 2 feet of floor space when not in use. The water is heated by gas or gasoline, heating, it is stated, 20 gallons of water in 20 minutes. It is designed to be placed in any apartment of the house. The sanitary Bath Chair is provided with a flexible mantel fitting closely around the neck, confining the heated air or vapors. In addition to these articles the company manufactures the Kitchen Pride and the Hamper and Toilet Case combined.

CRAIGHEAD & WILCOX, New York, selling agents for Craighead & Kintz Co., Lamps, Bronzes and Metal Goods; Walter S. Berg, Silk Lamp Shades; Hartford Silver Plate Company, Silver-Plated Ware, and Hacke, Jullien & Co., French China, issue an invitation to the trade to attend the opening of their new lines on and after February 15. A view of their salesrooms, 33 Barclay street and 38 Park place, is given on the folder.

Exports.

THE EXPORTS from the port of New York to foreign markets for the week ending February 4, 1893, exclusive of specie, amounted to \$8,529,141. The following are the exports of Hardware, Machinery, Metals and related goods. The items for Mexico include merchandise by seagoing vessels only:

Antwerp.—Hardware, \$239.—Firearms, \$340.—Stones, \$120.—Electrical Matl., \$2929.—Agricul. Impmts., \$1394.—Carpet Sweepers, \$42.

Avonmouth.—Machinery, \$580.

Amsterdam.—Hardware, \$368.—Freezers, \$51.—Machinery, \$154.

Argentine Republic.—Agricul. Impmts., \$2210.—Hardware, \$1925.—Manuftd. Wood, \$685.

Azores—Hardware, \$24.—Clocks, \$138.

British West Indies.—Hardware, \$1403.—Manuftd. Iron, \$1198.—Woodware, \$500.—Carriages, \$1606.—Coal, \$25.—Rubber Goods, \$111.—Building Matl., \$49.—Scales, \$343.—Tinware, \$197.—Carts, \$90.—Ox Bows, \$64.—Saws, \$55.—Whips, \$22.—Bak. Supplies, \$129.—Wheels, \$41.—Plated Ware, \$181.—Machinery, \$1179.—Refrigerators, \$67.—Doors, \$23.—Manuftd. Brass, \$25.—Springs, \$30.—Engine Supplies, \$50.—Firearms, \$26.—Barrel Trucks, \$45.—Cutlery, \$31.—Windlass, \$38.—Baby Carriage, \$14.—Manuftd. Wood, \$119.—Lamp Goods, \$383.—Tacks, \$9.—Nails, \$448.—Twine, \$159.—from Pipe, \$105.—Slates, \$77.—Coal, \$45.—Coffin Matl., \$16.—Clocks, \$113.—Pumps, \$106.—Velocipedes, \$23.—Freezers, \$30.—Brushes, \$21.—Carriage Matl., \$185.—Agricul. Impmts., \$51.—Oil Tank, \$5.—Roofing, \$172.—Electrical Goods, \$365.—Cider Mills, \$50.—Iron Safe, \$60.—Yellow Metal, \$23.

Bordeaux.—Agricul. Impmts., \$4077.

Bristol.—Manuftd. Wood, \$996.—Metal Dross, \$650.—Agricul. Impmts., \$225.—Zinc Ashes, \$27.—Woodware, \$175.—Clocks, 350.

Belfast.—Pumps, \$132.—Machinery, \$100.

Barcelona.—Agricul. Impmts., \$110.—Hardware, \$245.—Machinery, \$1100.—Brushes, \$15.

Bremenhaven.—Wire Goods, \$38.

Australia.—Tinware, \$282.—Hardware, \$226.—Whips, \$16.—Nails, \$39.—Scales, \$18.—Woodware, \$238.—Thermometers, \$15.—Manuftd. Wood, \$461.—Brushes, \$27.—Plated Ware, \$111.—Firearms, \$1120.—Clocks, \$283.—Pumps, \$85.—Trucks, \$40.—Lamp Goods, \$122.—Manuftd. Iron, \$61.—Shot Cases, \$41.—Machinery, \$1550.

Batum.—Machinery, \$1050.

British Guiana.—Hardware, \$55.—Cartridges, \$4.—Ice Pitcher, \$6.—Carriage Matl., \$30.—Roof Matl., \$655.—Freezers, \$29.—Tinware, \$10.—Iron Pipe, \$470.—Hardware, \$35.—Dock Trucks, \$84.—Nails, \$54.—Water Coolers, \$31.—Manuftd. Wood, \$411.—Firearms, \$11.—Woodware, \$55.—Cutlery, \$65.—Manuftd. Iron, \$35.—Nails, \$27.—Lamp Goods, \$468.—Pumps, \$119.—Barrel Trucks, \$170.—Lathe, \$9.—Scales, \$61.

Berlin.—Machinery, \$1300.—Rubber Goods, \$156.—Woodware, \$310.

Brussels.—Agricul. Impmts., \$100.

British East Indies.—Firearms, \$90.—Railroad Velocipedes, \$37.—Windmills, \$593.—Plated Ware, \$90.—Saws, \$29.—Hardware, \$90.—Freezers, \$275.—Agricul. Impmts., \$1202.—Clocks, \$372.—Cartridges, \$40.—Carriages, \$151.—Lamp Goods, \$1117.—Manuftd. Wood, \$33.

Bolivia.—Pumps, \$40.—Woodware, \$20.—Machinery, \$20.—Hardware, \$20.—Clocks, \$30.

Brussels.—Agricul. Impmts., \$100.

British Possessions in Africa.—Car, \$1580.—Windmill Matl., \$520.—Hardware, \$10,339.—Wheelbarrows, \$106.—Pumps, \$143.—Wire Goods, \$1.—Scales, \$341.—Freezers, \$12.—Washers, \$300.—Weights, \$460.—Water Wheels, \$178.—Refrigerators, \$90.—Wringers, \$148.—Hose, \$70.—Plated Ware, \$520.—Nails, \$100.—Machinery, \$7185.—Woodware, \$1558.—Agricul. Impmts., \$15,870.—Clocks, \$1289.—Carriage Matl., \$2596.—Rubber Goods, \$185.—Manuftd. Iron, \$7784.—Scales, \$127.—Axes, \$156.—Cages, \$121.—Saws, \$210.—Nails, \$1080.—Hand Carts, \$245.—Manuftd. Wood, \$2385.—Lamp Goods, \$394.—Stamped Ware, \$23.—Sash Cord, \$76.—Grindstones, \$46.—Brushes, \$165.—Cotton Lines, \$29.—Cartridges, \$86.

Bremen.—Sandpaper, \$455.—India Rubber Waste, \$400.—Machinery, \$1945.—Manuftd. Wood, \$642.—Emery Wheels, \$304.—Wire Goods, \$36.—Manuftd. Iron, \$49.—Agricul. Impmts., \$171.—Brushes, \$100.—Organs, \$120.—Lamp Goods, \$8.—India Rubber, \$60.—Hardware, \$2537.—Freezers, 57.

Brazil.—Manuftd. Wood, \$145.—Nails, \$333.—Scales, \$10.—Wheelbarrows, \$95.—Needles, \$148.—Cutlery, \$3871.—Machinery, \$1312.—Wire Goods, \$48.—Twine, \$847.—Saws, \$217.—Per. Caps, \$189.—Clocks, \$1032.—Stamped Ware, \$3.—Boiler Matl., \$566.—Plumbing Matl., \$82.—Bicycles, \$76.—Cotton Guns, \$196.—Brushes, \$65.—Hardware, \$562.—Manuftd. Iron, \$315.—Lamp Goods, \$1240.—Rope, \$309.—Electrical Goods, \$911.—Rubber Goods, \$588.—Scales, \$527.—Cartridge Boxes, \$14.—Locomotives, \$18,000.—Woodware, \$83.—Firearms, \$2458.—Sandpaper, \$114.—Hoop Iron, \$37.—Cartridges, \$565.—Nails, \$145.—Wheels, \$11.—Pumps, \$180.—Crucibles, \$12.—Water-Closet Fittings, \$30.—Velocipedes, \$18.—Tin Sheets, \$107.—Barrows, \$35.—Babbitt Metal, \$386.

Catania.—Hardware, \$277.—Bullets, \$10.—Tinware, \$7.—Firearms, \$388.—Freezers, \$6.

Charkow.—Agricul. Impmts., \$1350.

China.—Lamp Goods, \$36.—Twine, \$19.—Nails, \$500.—Compasses, \$70.—Wringers, \$18.—Scales, \$220.—Car Matl., \$148.—Hand Cars, \$220.—Rubber Goods, \$303.—Manuftd. Wood, \$36.—Clocks, \$767.—Electrical Goods, \$300.—Agricul. Impmts., \$100.—Hardware, \$547.

Central America.—Manuftd. Iron, \$7388.—Machinery, \$192.—Electrical Matl., \$275.—Iron, \$131.—Pumps, \$287.—Tank, \$40.

Crajkow.—Agricul. Impmts., \$40.

Cuba.—Manuftd. Wood, \$398.—Machinery, \$13,588.—Electrical Goods, \$6635.—Iron Pipe, \$6427.—Cutlery, \$5194.—Scales, \$1563.—Rubber Goods, \$340.—Rum Pipes, \$210.—Crucibles, \$18.—Street Lamps, \$17.—Grindstones, \$80.—Locomotive Parts, \$150.—Metal Goods, \$200.—Steam Whistle, \$13.—Gas Fixtures, \$14.—Iron, \$1285.—Railroad Matl., \$16,115.—Hose, \$374.—Barrows, \$130.—Oil Cups, \$21.—Boiler Matl., \$18.—Iron Wheel, \$25.—Plantation Cars, \$4972.—Wire Rope, \$19.—Sugar Molds, \$1565.—Well Matl., \$7.—Brass Valves, \$100.—Car Seats, \$155.—Pipe Covering, \$970.—Boilers, \$900.—Flat Cars, \$450.—Tacks, \$25.—Springs, \$833.—Copper, \$300.—Plated Ware, \$155.—Britannia Ware, \$356.—Velocipedes, \$61.—Hardware, \$8231.—Manuftd. Iron, \$3688.—Lamp Goods, \$806.—Clocks, \$71.—Pump, \$4972.—Sugar Wagons, \$731.—Nuts, \$36.—Packing, \$117.—Woodware, \$435.—Spikes, \$100.—Manuftd. Copper, \$30.—Belting, \$74.—Nails, \$992.—Boiler Tubes, \$1999.—Manuftd. Steel, \$79.—Steel, \$52.—Tinware, \$251.—Bathtub Matl., \$178.—Manuftd. Brass, \$65.—Railroad Cars, \$19,785.—Iron Safes, \$487.—Cars, \$65.—Trucks, \$288.—Saws, \$165.—Roof Matl., \$911.—Locomotives, \$29,730.—Bent Tubes, \$235.—Saw Teeth, \$38.—Lead Seals, \$110.—B. Compound, \$200.—Rope, \$424.—Railroad Tank Cars, \$390.—Car Matl., \$227.—Brushes, \$159.—Valves, \$132.—Agricul. Impmts., \$15.—Gas Cylinders, \$134.—T. R. Block, \$350.—Baby Carriages, \$102.—Bicycles, \$250.

Chili.—Coffins, \$165.—Machinery, \$436.—Cartridges, \$78.—Nails, \$2004.—Coffin Matl., \$1210.—Manuftd. Iron, \$56.—Lamp Goods, \$40.—Electrical Matl., \$11.—Plated Ware, \$411.—Freezers, \$25.—Velocipedes, \$5.—Firearms, \$70.—Pump, \$30.—Springs, \$18.—Rubber Goods, \$194.—Hardware, \$1345.—Nails, \$20.—Agricul. Impmts., \$770.—Clocks, \$437.—Granite Ware, \$150.—Brushes, \$61.—Tinware, \$368.—Cutlery, \$21.

Dutch Guyana.—Manuftd. Iron, \$14.—Boiler Tubes, \$111.—Woodware, \$0.0.—Lamp Goods, \$1.

Dutch West Indies.—Hardware, \$38.—Manuftd. Iron, \$30.—Lamp Goods, \$38.—Brushes, \$12.—Nails, \$28.—Woodware, \$22.—Cutlery, \$8.—Whips, \$5.—Machinery, \$83.—Hand Trucks, \$15.—Twine, \$2.—Rubber Goods, \$15.—Carriage Matl., \$53.—Needles, \$5.—Hand Cart, \$12.—Tinware, \$2.—Wire Goods, \$20.—Showcases, \$6.—Clocks, \$18.

Dublin.—Manuftd. Wood, \$372.—Windmills, \$72.—Hardware, \$27.

Ecuador.—Clocks, \$194.—Hardware, \$885.—Plated Ware, \$19.—Baby Carriages, \$20.—Firearms, \$16.

Genoa.—Lubricators, \$225.—Manuftd. Iron, \$90.—Razor Straps, \$40.—Firearms, \$924.—Agricul. Impmts., \$668.—Machinery, \$1620.—Cotton Gins, \$540.—Whips, \$9.—Hardware, \$805.—Scales, \$3.—Manuftd. Wood, \$19.—Freezers, \$133.

Glasgow.—Clocks, \$630.—Agricul. Impmts., \$624.—Hardware, \$200.—Machinery, \$340.—Tiles, \$150.—Windmills, \$60.—Manuftd. Iron, \$12.—Belting, \$150.—Tinware, \$5.—Machinery, \$225.—Manuftd. Wood, \$1341.

Gibraltar.—Firearms, \$2538.—Cartridges, \$208.

Hango.—Agricul. Impmts., \$18.

Halifax.—Brass Wire, \$374.

Hayti.—Manuftd. Iron, \$7.—Lamp Goods, \$20.—Wheelbarrow, \$17.—Water Wheel, \$978.—Hardware, \$38.—Clocks, \$12.—Nails, \$5.—Trunk Matl., \$8.—Twine, \$118.—Nails, \$11.

Hull.—Hardware, \$1413.—Manuftd. Wood, \$1000.—Agricul. Impmts., \$1187.—Electrical Matl., \$3600.

Hong Kong.—Brushes, \$200.—Agate Ware, \$160.—Clocks, \$231.—Hardware, \$126.—Twine, \$30.

Hamburg.—Agricul. Impmts., \$17,120.—Tinware, \$70.—Cutlery, \$57.—Sweepers, \$60.—Firearms, \$173.—Freezers, \$255.—Manuftd. Iron, \$70.—Needles, \$50.—Speleer, \$4705.—Britannia Ware, \$489.—Clocks, \$9.—Manuftd. Wood, \$214.—Hardware, \$6638.—Machinery, \$1298.—Whip Sockets, \$50.—Wringers, \$72.—Wire Goods, \$78.—Electrical Goods, \$1835.—Belting, \$1997.—Scales, \$20.—Copper Bullion, \$2400.—Precipitate of Silver, \$17.—Nails, \$19.—Iron Tubes, \$30.—Iron Safe, \$40.

Sandwich Islands.—Wire Goods, \$6.—Lamp Goods, \$1001.—Locomotive Parts, \$100.—Firearms, \$101.—Hardware, \$1917.—Woodware, \$137.—Bellows, \$48.—Axes, \$20.—Mfs. of Wood, \$89.—Horsehoes, \$910.—Stamped Ware, \$3.—Filters, \$50.—Ox Bows, \$50.—Pumps, \$39.—Grindstones, \$11.—Powder, \$21.—Building Matl., \$1125.—Yellow Metal, \$2816.—Nails, \$2708.—Brass, \$56.—Manuftd. Iron, \$357.—Nails, \$198.—Agricul. Impmts., \$1005.—Springs, \$69.—Charcoal Irons, \$212.—Sash Weights, \$32.—Spikes, \$57.—Tacks, \$16.—Cotton Cord, \$37.—Agate Ware, \$6.—Tinware, \$26.

St. Petersburg.—Hardware, \$104.

St. Helens.—Woodware, \$870.

Smyrna.—Twine, \$24.—Grindstones, \$89.—Agricul. Impmts., \$1370.

St. Gall.—Rubber Goods, \$60.

Taganrog.—Agricul. Impmts., \$5000.

Trapani.—Windmills, \$247.

Uruguay.—Hardware, \$630.

United States of Colombia.—Manuftd. Iron, \$32.—Machinery, \$550.

Venezuela.—Scales, \$525.—Cutlery, \$395.—Telephones, \$102.—Rubber Goods, \$19.—Brass Goods, \$38.—Machinery, \$1881.—Clocks, \$21.—Stocks and Dies, \$13.—Freezers, \$9.—Woodware, \$59.—Tinfoil, \$31.—Trucks, \$9.—Needles, \$37.—Nails, \$284.—Silver Ware, \$34.—Springs, \$23.

Wheelbarrows.—\$60.—Agricul. Impmts., \$14.—Hardware, \$1048.—Manuftd. Iron, \$1408.—Lamp Goods, \$166.—Twine, \$607.—Brushes, \$23.—Wire Goods, \$105.—Tinware, \$5.—Pumps, \$180.—Manuftd. Copper, \$32.—Baby Carriages, \$47.—Velocipedes, \$48.—Iron Safes, \$107.—Electrical Matl., \$1442.—Surveying Instruments, \$220.—Tacks, \$81.

Vienna.—Agricul. Impmts.—\$15,400.—Twine, \$15.

India.—India Rubber, \$6733.—Molds, \$5.—Electrical Matl., \$2835.—Fishing Rod, \$18.—Firearms \$60.—Bicycle, \$50.—Water Meters, \$383.—Hardware, \$1824.—Emery Wheels, \$77.—Aluminum, \$1200.—Manuftd. Copper, \$50.—Manuftd. Iron, \$73.—Manuftd. Wood, \$1928.—M. Rollers, \$750.—Pumps, \$1130.—Woodware, \$1735.—Copper Matte, \$23,000.—Clothes Wringers, \$110.—Brass Goods, \$32.—Rubber Goods, \$988.—Belting, \$15.—Plated Ware, \$46.

Lancaster.—Machinery, \$400.

Londonderry.—Agricul. Impmts., \$60.

Leith.—Lamp Goods, \$430.

Leeds.—Machinery, \$300.

Liberia.—Hardware, \$42.—Clocks, \$11.—Scales, \$3.—Nails, \$19.—Manuftd. Wood, \$31.—Manuftd. Iron, \$6.

Lisbon.—Agricul. Impmts., \$119.—Clocks, \$1673.—Crucibles, \$134.—Lamp Goods, \$58.

Mexico.—Hardware, \$2204.—Manuftd. Wood, \$255.—Steel Tires, \$3661.—Cartridges, \$50.—Shot, \$50.—Scales, \$97.—Trunk Matl., \$17.—Nails, \$22.—Rubber Goods, \$12.—Closets, \$37.—Pumps, \$462.—Copper Goods, \$60.—Percussion Caps, \$41.—Woodware, \$44.—Tinware, \$102.—Washers, \$54.

Naples.—Hardware, \$42.—Clocks, \$11.—Tinware, \$76.—Lubricators, \$266.

Newcastle.—Agricul. Impmts., \$84.

Marseilles.—Machinery, \$236.—Electrical Matl., \$400.—Crucibles, \$63.—Agricul. Impmts., \$327.

Messina.—Firearms, \$307.—Hardware, \$135.

Moscow.—Scaies, \$815.—Machinery, \$1704.

Naples.—Hardware, \$640.—Clocks, \$30.—Firearms, \$550.—Agricul. Impmts., \$1855.—Plated Ware, \$7.

Newcastle.—Machinery, \$300.

New Zealand.—Hardware, \$552.—Manuftd. Iron, \$88.—Carriage Matl., \$15.—Wringers, \$25.—Lamp Goods, \$35.—Saws, \$149.—Agricul. Impmts., \$5—Clocks, \$9.

Newfoundland.—Iron Safes, \$125.—Firearms, \$17.—Saws, \$30.—Tiling, \$301.—Hardware, \$96.—Rubber Goods, \$51.—Woodenware, \$22.—Manuftd. Wood, \$28.—Machinery, \$190.—Stamp Goods, \$17.—Lamp Goods, \$31.—Plumbing Matl., \$116.—Locks, \$42.—Manuftd. Iron, \$155.—Metal Goods, \$18.—Roofing Matl., \$56.—Twine, \$10.

Nova Scotia.—Sporting Goods, \$15.—Lamp Goods, \$10.—Plumbing Matl., \$145.—Manuftd. Iron, \$13.—Brass Goods, \$317.—Hardware, \$20.

Opporto.—Firearms, \$145.—Clocks, \$404.

Odessa.—Agricul. Impmts., \$565.

Philippines.—Brushes, \$70.—Scales, \$445.—Manuftd. Iron, \$18.—Lamp Goods, \$820.—Agricul. Impmts., \$171.—Hardware, \$57.—Clocks, \$50.

Palermo.—Firearms, \$1823.—Tinware, \$13.—Plated Ware, \$57.—Hardware, \$54.—Manuftd. Wood, \$39.—Pumps, \$99.

Porto Rico.—Machinery, \$339.

Piraeus.—Lamp Goods, \$250.

Peru.—Manuftd. Iron, \$278.—Lamp Goods, \$40.—Hardware, \$75.

Rotterdam.—Cart, \$124.—Wringers, \$204.—Manuftd. Wood, \$30.—Pumps, \$64.—Manuftd. Iron, \$14.—Copper, \$13,446.—Machinery, \$211.—Hardware, \$81.—Manuftd. Wood, \$18.—Belting, \$120.—Hand Car, \$30.—Scales, \$15.—Cutlery, \$36.

San Domingo.—Manuftd. Iron, \$800.—Saws, \$18.—Nails, \$223.—Machinery, \$200.—Railroad Matl., \$5.—Scales, \$22.—Solder, \$20.—Carriage Matl., \$12.—Cart Matl., \$14.—Woodware, \$18.—Belting, \$12.—Manuftd. Wood, \$18.—Belting, \$120.—Hand Car, \$30.—Scales, \$15.—Cutlery, \$36.

Sandwich Islands.—Wire Goods, \$6.—Lamp Goods, \$1001.—Locomotive Parts, \$100.—Firearms, \$101.—Hardware, \$1917.—Woodware, \$137.—Bellows, \$48.—Axes, \$20.—Mfs. of Wood, \$89.—Horsehoes, \$910.—Stamped Ware, \$3.—Filters, \$50.—Ox Bows, \$50.—Pumps, \$39.—Grindstones, \$11.—Powder, \$21.—Building Matl., \$1125.—Yellow Metal, \$2816.—Nails, \$2708.—Brass, \$56.—Manuftd. Iron, \$357.—Nails, \$198.—Agricul. Impmts., \$1005.—Springs, \$69.—Charcoal Irons, \$212.—Sash Weights, \$32.—Spikes, \$57.—Tacks, \$16.—Cotton Cord, \$37.—Agate Ware, \$6.—Tinware, \$26.

St. Petersburg.—Hardware, \$104.

St. Helens.—Woodware, \$870.

Smyrna.—Twine, \$24.—Grindstones, \$89.—Agricul. Impmts., \$1370.

St. Gall.—Rubber Goods, \$60.

Taganrog.—Agricul. Impmts., \$5000.

Trapani.—Windmills, \$247.

Uruguay.—Hardware, \$630.

United States of Colombia.—Manuftd. Iron, \$32.—Machinery, \$550.

Venezuela.—Scales, \$525.—Cutlery, \$395.—

PRIZE COMPETITIONS.

WE HEREBY ANNOUNCE a series of six prize competitions relating to trade matters in which our readers are interested. Four prizes of \$50, \$25, \$15 and \$10 will be awarded in each competition.

The competitions are open to all and a general participation on the part of the trade is invited.

We shall have the privilege of publishing any or all of the contributions received.

The committee of award in assigning prizes will take into account the merit of the different contributions and their suitability for publication.

PRIZE COMPETITION No. 6.

How Retailers Can Best Advertise and Extend Their Business.

The object of this competition is to obtain practical suggestions as to the methods which the retail dealer in Hardware, Stoves, Tinware, &c., can advantageously adopt in building up his business, and is intended to cover such points as the following :

Advertising in the local papers, with suggestions as to how such advertising should be done and to what extent ;

The manner in which circulars and other printed matter may be used ;

A description of any special or unusual methods of attracting and holding trade ; and

General suggestions in regard to ways in which the business can be extended.

An account of any methods which have been found useful in building up trade will be suitable under this competition.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 6.

PRIZE COMPETITION No. 7.

Travelers' Yarns.

The traveling salesman is proverbially happy in the stories which he narrates, and this competition is for the purpose of calling out a collection of good yarns for publication. While the attention of travelers is specially invited to this competition, it is open to all. Stories relating more or less closely to trade or business matters will be preferred.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 7.

PRIZE COMPETITION No. 8.

How to Treat Clerks.

Under this competition, beside a general discussion of the subject, such questions as the following may be considered :

The extent to which clerks should be given an opportunity of obtaining a knowledge of the business, and of price-lists, prices, &c.;

Whether it is desirable to have formal rules for the regulation of employees and for the management of the store. If so, a set of rules should be submitted ;

To what extent clerks should be held responsible for their mistakes ;

Suggestions as to how clerks should be treated in order to secure their most intelligent and efficient work ;

Mistakes made in the treatment of clerks.

This competition opens an important subject and it is hoped that it will be discussed fully by merchants and by their clerks from their different points of view.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 8.

PRIZE COMPETITION No. 9.

Shop System of Keeping Track of Jobs.

This competition is intended to call out information in regard to methods of keeping account of the cost of labor and material on tin-shop work, repairing and new work, inside and outside. In connection with the general subject such points as the following may be touched upon :

Whether blanks or forms are used in connection with such work. (If so, samples should be submitted) ; What record is kept of orders, costs of jobs, charges, &c. ; How time occupied in going to and from the job is covered ; Suggestions in regard to the profitable conduct of the shop.

To illustrate the system it is desirable that a specific job (as for example, repairing down spouting and eave trough, or other job of repairing in which new material is used) be referred to and the method of keeping track of the costs in such job fully explained.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 9.

PRIZE COMPETITION No. 10.

Business Maxims—At Least 10.

Those entering this competition will send at least ten maxims relating to the conduct of business, presenting in a brief and pithy manner practical suggestions which may advantageously be followed.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 10.

PRIZE COMPETITION No. 11.

How Small Retailers May Keep a Record of Prices.

The object of this competition is to call out information or suggestions in regard to the best methods to be adopted in keeping a record of prices, showing cost or selling prices, or both cost and selling prices, of Hardware, Stoves, Tinware, &c., in a small retail store employing not more than four persons in the selling and bookkeeping departments, including the proprietors. Those entering the competition are expected to give a concise and clear explanation of their system, and if a price book is used, to submit as illustrating the system at least three specimen pages. If a price book is referred to it may be of any design or arrangement best adapted to the purpose, and may be original with the contributor or may be one of the different price books on the market. Fictitious names should be used instead of the real names of jobbers and manufacturers.

The committee in awarding prizes will take into account the merit of the different systems described, the character of the descriptions given, and the general utility and interest of the contribution.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 11.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

General expectation of lively business as soon as the spring season opens figures more conspicuously than actual doings in the market for Paints and Colors. Business, as a matter of fact, has been somewhat backward, and, according to most accounts, the distribution during the past fortnight has fallen somewhat short of average volume for the first half of February. This condition of affairs is attributed chiefly to weather conditions having been extremely adverse to outdoor work in nearly all territory that draws upon New York for supplies. However, grinders seem to be kept well employed on various specialties, more particularly the varieties by car and wagon builders and in minor industries that are carried on within doors.

White Lead.—Corroders and other manufacturers are working diligently in the direction of stimulating purchases of their respective products, but deliveries on old contracts seem to meet the requirements of jobbers in a great degree since outlets are kept narrow by cold and stormy weather. On prices of "outside" brands of unmixed carbonate and also in the instance of some mixtures, there is the usual irregularity, but list prices on National Lead Company's brands do not appear to be departed from by the manufacturers. Jobbers, however, still adapt their selling prices to meet circumstances, and, not infrequently handle the pigment as a "leader" or "trade winner" rather than for profit, where desirable orders for other goods may be attracted thereby.

Red Lead and Litharge.—None but routine movement is reported by manufacturers of American brands, and sales of imported are represented as being extremely moderate. There are no signs of pressure to sell, however, and prices remain stationary all along the line.

Orange Mineral.—There is no change in the character of reports as to business in this article. All go to show that individual purchasers have continued on a moderate scale, and that the business passing is almost wholly at the line of prices that has ruled for some time past.

Zincs.—Orders for American Oxide are not particularly numerous at the moment, but deliveries in execution of old contracts, it is generally claimed, prevent any burdensome accumulation in manufacturers' hands. The old line of prices is quoted and there is no sign of any rupture in the understanding between manufacturers. Foreign Oxide has met with rather slow sale, but shipments to this market are kept closely in line with the distribution and former prices are maintained.

Colors, &c.—Some manufacturers report a better run of orders latterly for American Quicksilver Vermilion, Carmine and certain lines of Blues, but, taken as a whole, the trade in Dry Colors is a little slow. Oil Colors have been quiet also, and general report is to the effect that business in ready-mixed Paints does not run above the average for the season. Changes in prices have been few and comparatively insignificant.

Miscellaneous.—In the absence of heavy arrivals or anything more than commonplace demand, the market for Block Chalk remains without change and prices are for the moment somewhat uncertain. On Whiting and Paris White manufacturers' prices have not changed and the market for the goods is rather slow at the moment. Regarding the Putty market about the same is to be said. Talc is momentarily in moderate supply, but China Clay and Terra Alba are secured without difficulty at former prices. The market for Barytes is without radical change.

Oils and Turpentine.

Nearly all branches of the market for animal and vegetable Oils are still governed, directly or indirectly, by the high cost of Lard and inferior Greases. The movement in prices of those commodities has continued in the direction of a higher level, and, where any have taken place, the changes in prices of Oils have, as a matter of course, shown an advance. That the extremely high prices have led to the use of substitutes where practicable and encouraged adulteration is by no means uncertain, but the fact remains that nearly everything that goes into the manufacture of lubricants, into soap-making and in the composition of Lard compounds is finding an exceptionally good market at the present time. The future of the market for many Oils depends in a good measure upon developments in the Lard market.

Linseed Oil.—Of the prominent lines of Oils, Linseed product has been the one particularly quiet commodity during the past week. Sensational features in connection with the movement to concentrate the production have disappeared; the expected advance in prices on account of enhanced cost of raw material has been tardy about materializing and the general report goes to show that neither jobbers or large consumers have purchased except in a perfunctory way. As for speculation, no sign of anything in that direction has been visible.

Cotton-Seed Oils.—Local dealings have involved merely ordinary quantities and the volume of business effected here loses by comparison with that of the preceding two or three weeks. But large sales of both crude and refined product for direct shipment from the primary sources of supply have not only enlivened affairs, but served to establish a higher level of prices in that quarter. Thus Prime crude realized 55¢ in bulk at Southern point, against 55¢ @ 56¢ for the same grade in barrels here. The high Southern prices resulted ultimately in an advance in New York quotations to 58¢ for Prime crude, 62¢ @ 63¢ for Prime Summer Yellow, 70¢ @ 71¢ for Prime Summer White, and corresponding prices for other varieties. There is still a considerable speculative interest in the market, but at last accounts the speculators were more willing to sell than anxious to buy at the higher range of prices.

Lard Oil.—Some local pressers have current production so closely sold up that they refuse to take other than small orders or a lower price than \$1.05 per gallon, prompt delivery, for Prime Oil. Some pressers whose product is not under as close control made sales late in the week at 2¢ @ 3¢ less, and moderate consignments of Western brands were closed out at \$1. For the present, market value is very uncertain, but the appearances are that it is extremely difficult to purchase strictly prime present make Oil at less than \$1.03 @ \$1.05. Low grades have been advanced in price to the basis of about 75¢ @ 80¢ for extra No. 1, the latter rate for single barrels.

Fish Oils.—Supplies of crude Sperm are closely concentrated, and the selling price has been raised to 95¢ in New Bedford. The Bleached product is correspondingly higher, being quoted now at 95¢ @ 97¢ for Natural Winter and \$1 @ \$1.02 for Bleached Winter. Whale, Menhaden and Cod products, while not quotably higher, are decidedly stronger, with prices showing an advancing tendency.

Miscellaneous.—Good sales have been made of Ceylon Cocoanut Oil at 6½¢, to arrive, and 6½¢ on spot. Cochin is up to 6¾¢ on spot and 6¾¢ for future arrival. Olive Oils have been moving to a fair extent in moderate quantities chiefly at about former prices, say 65¢ @ 67¢ for spot lots.

Spirits Turpentine.—Business has been merely fair during the past week, yet distribution has run somewhat ahead of the receipts. That fact, along with firm advices from the South, has served to stiffen prices here to 35½¢ for regular and 35½¢ for machine barrels.

CONTENTS.

PAGE.	
A Steel Furnace Hearth Casing.....	355
The Higley Cold Saw. Illustrated.....	355
The Bates Process in England.....	356
The Lodge & Davis Bolt Cutter and Nut Tapper. Illustrated.....	357
Belgian Iron Production and Wages.....	357
World's Fair Notes.....	358
The Lunkenheimer Piston Whistle. Illus.....	359
Labor in England.....	359
The Priestman Engine as Made in America. Illustrated.....	360
Maunessmann Locomotive Boiler Tubes.....	364
Production of Pig Iron and Coal in Germany in 1892 and 1891.....	364
Effect of Time on the Qualities of Steel.....	364
The Leader Sawing Machine. Illustrated.....	365
The Small Arms of the Great Powers.....	365
The Development and Transmission of Power from Central Stations. Illus.....	366
The Dean Underwriters' Pump. Illus.....	369
The New Doty Shear. Illustrated.....	369
The Week.....	370
Editorials:	
Gold Bonds or Repeal?.....	371
Manufacturers and the Pinkerton Service.....	371
Chicago Railroad Interests.....	371
The Illinois Steel Company.....	372
Diversified Agriculture.....	372
The Cost of Bad Workmanship in Ship-building.....	373
Obituary:	
The Tin Petition.....	373
The Worthington Pump Company.....	374
The New British Labor Department.....	375
The American Lamp & Brass Company.....	375
Virginia's Iron Prospects.....	375
The World's Wheat Product.....	375
Washington News.....	376
Manufacturing:	
Iron and Steel.....	376
Machinery.....	377
Miscellaneous.....	377
Trade Report:	
Chicago.....	378
Philadelphia.....	379
Detroit.....	380
Baltimore.....	380
Cincinnati.....	380
Pittsburgh.....	380
Cleveland.....	381
Boston.....	382
Financial.....	383
Metal Market.....	383
Coal Market.....	384
New York.....	384
The German Iron Trade.....	384
British Iron and Metal Markets.....	385
St. Louis.....	385
Trade Publications.....	385
Hardware:	
Condition of Trade.....	386
Notes on Prices.....	387
Export Notes.....	388
500-Mile Tickets.....	389
What the Trade Say About the Price-List for Cut Nails.....	389
Agricultural Implements in Mexico.....	390
Weekly Prize Competitions.....	390
Trade in Builders' Hardware.....	391
An Australian Hardware Establishment Illustrated.....	392
Hardware as Specified.....	393
Trade Items.....	394
Louisville Trade.....	394
It Is Reported—	395
Price-Lists, Circulars, &c.	395
Exports.....	396
Prize Competitions.....	397
Paints and Colors.....	398
Model A Bicycle, 1893 Pattern. Illus.....	399
Nonpareil Ratchet Wrenches and Combinations. Illustrated.....	399
The Winner for '93. Illustrated.....	400
Self-Measuring Pump. Illustrated.....	400
Hilt's Adjustable Chain-Pipe Wrench. Illus.....	401
Black Hawk Light Roadster. Illus.....	401
Pressed Steel Pans. Illustrated.....	401
Avery's Never-Leak Steel Hoods. Illus.....	402
Electric Chafing Dish. Illustrated.....	402
New Pattern Milk Can. Illustrated.....	402
Current Hardware Prices.....	403
Current Metal Prices.....	410

Model A Bicycle, 1893 Pattern.

E. C. Stearns & Co., Syracuse, N. Y., are putting their 1893 pattern of wheel on the market, as shown in the accompanying cut. It is of the pure Humber lines of diamond frame and weighs 28 pounds with the road tire. The rear wheel is 28 inches and the front wheel 30 inches, both with tangent laced spokes. It is regularly made with rat-trap pedals, but rubber pedals will be substituted when so ordered. The machines will be carried in stock with orange rims, and the body of the wheel may be had in the following colors appropriately striped: Black, maroon, blue or dark green. Particular attention is directed to the beautiful enamel and nickel work, and to the general shaping of all

*Model A Bicycle, 1893 Pattern.*

parts. The point is made that unnecessary parts have been scrupulously avoided, such parts and weight as do not add to the strength or to the convenience of the wheel having been discarded. The line consists of four weights of wheels, which vary somewhat in design but are all on the same general lines; the size and weight of the wheels and tires and the gauge of tubing playing an important part in making the weights. All the parts used in the construction of these wheels, such as full ball bearings, drop forged steel connections, tool steel bearings, seamless steel tubing, &c., are referred to as of the highest order of their kind, and the shaping and fitting the various parts into a whole as accomplished by the most improved methods.

Nonpareil Ratchet Wrenches and Combinations.

The Keystone Mfg. Company, 312 Terrace, Buffalo, N. Y., are introducing these goods, which are illustrated in the accom-

*Fig. 1.—Nonpareil Ratchet Wrench.*

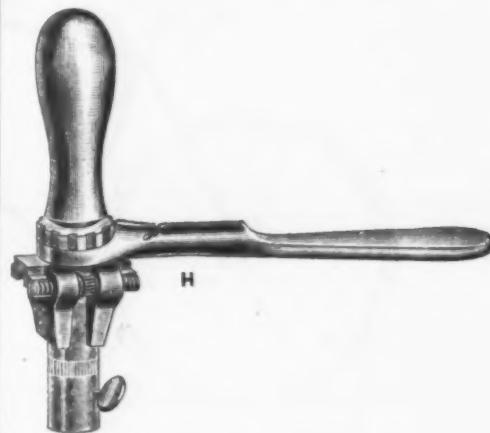
panying cuts. These tools are described by them as made of the best material, highly polished and nickel-plated throughout and of excellent mechanical construction. The tools are designed to be used in combination; combination No. 1 including those shown in Figs. 1, 2, 3 and 4,

except that only two of the sockets in Fig. 4 are included in the price for the combination. Socket B, Fig. 4, is for screw-driver bit or reamer shank and is used with the wood handle, Fig. 2.

*Fig. 2.—Wood Handle.*

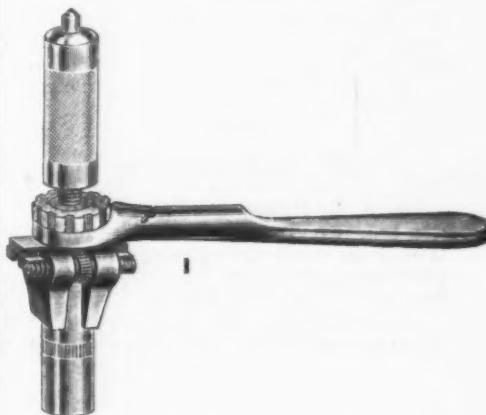
Socket D, the bottom one shown in Fig. 4, is for drill shank and is used with the feed nut, Fig. 3. The center socket in Fig. 4 is for Morse taper shank drills and is used with feed nut, Fig. 3, but is

taper, the socket is attached in the same manner, but the feed nut, Fig. 3, is screwed down on the socket, forming a complete drill, Fig. 6. The wrench may be made reversible instantly without removal from the work simply by throwing

*Fig. 5.—Bit Socket and Handle Combined.*

over the lever in the slot of the handle, which changes the direction of the ratchet.

The wrench may be used by itself for hexagon and octagon nuts, and also for square nuts. The combination, Fig. 5, may be used to advantage in many places

*Fig. 6.—Drill Socket and Feed Nut Combined*

sent only when ordered. The socket attachments are made to take different sizes of bit, drill and reamer shanks, and are quickly and easily adjusted in the wrench. The wrench, Fig. 1, is 9 inches long, having jaws which open from $\frac{1}{16}$ to $1\frac{1}{2}$ inches, ad-

*Fig. 3.—Feed Nut.*

justed and regulated by a right and left screw by means of the thumb nut A, with right and left hand ratchet. The shank of the socket is passed between the jaws of the wrench and up through the circular hole in the ratchet plate, when the jaws are closed firmly with the thumb nut A. The top of the jaws are thus brought under the shoulders of the socket, firmly locking

*Fig. 4.—Bit and Drill Sockets.*

the attachment in the wrench. In using socket B, Fig. 4, the wood handle C is placed upon the socket and the thumb nut screwed down, thereby securing it while in use, as shown in Fig. 5. In using the drill attachments D, either square or Morse

as a wrench for small nuts; for instance, on the nuts inside of wheel felloes, &c. The tools can be used successfully at almost any angle, or in any position, and are referred to as being adapted to the uses of engineers, machinists, boiler makers, electricians, plumbers and gas fitters, millwrights, agricultural implement manufacturers and dealers, carriage and wagon

*Fig. 7.—Round Jaw Nonpareil Ratchet Wrench.*

makers, wood workers, &c. Owing to the peculiar and improved mechanical construction of the tools, the manufacturers claim a great degree of strength, durability and latitude of usefulness, with handsome finish. A combination, known as Mammoth No. 5, is made similar to combination No. 1, only larger, constructed especially for heavy work, such as boiler making, bridge building, &c., and general heavy machine work. Combination No. 3 is wrench, Fig. 1, with a drill attachment, feeding with a screw in-

stead of a nut, as in No. 1 combination. It is designed especially for light work in limited space, and is furnished with a

any of the body of the wire, and have brass nipples carefully fitted, with rims of cold-drawn steel perfectly rolled and with

axles prevents any turning or slipping, and any lost motion can be instantly taken up by a turn of a nut. The machine has a wheel base of 44 inches, is provided with Morgan & Wright pneumatic tires, geared to 60 inches, higher or lower if desired, and weighs 34 pounds. The ladies' wheel, Fig. 3, is made on the same specifications, but has drop tube, brake to front wheel, dress and mud guards.



Fig. 1.—The Winner for '93.

square socket only. The round jaw, No. 2 wrench, Fig. 7, without combination, is intended especially for use on axle nuts of carriages, buggies, wagons, &c., also for the various requirements of all agricultural implements and machinery and for domestic purposes. The jaws of this wrench are adjusted the same as Fig. 1, and the wrench is also made in a No. 5 round jaw, on exactly the same principle as Fig. 7, only of increased size.

The Winner for '93.

The S. A. Haines Company, Indianapolis, Ind., have changed the lines of the Winner for the coming season, and otherwise improved the machine, as shown in Fig. 1. It has the Humber Diamond frame, made from the best quality of Weddless steel tubing, with drop forgings

edges all true. The cranks are of especial pattern, and are easily detachable without hammering, yet held firmly in place by a



Fig. 2.—Detailed Views of the Crank.

nut, also a key, by a turn of which they can be adjusted, and all lost motion instantly taken up, as shown in Fig. 2. Their

Self Measuring Pump.

The Bevan Mfg. Company, through Morgan & Cornell, 42 Hudson street, New York, are introducing an improved pump, as here illustrated. This is designated



Bevan Self-Measuring Pump.

as a self-measuring liquid conveyor, intended largely for handling kerosene, benzine, turpentine, &c., dispensing with the use of tanks, funnels and measures. The



Fig. 3.—Ladies' Winner.

throughout, and bearings of the finest quality of steel, perfectly fitted with steel balls. The spokes are made by a process

which avoids all necessity of cutting away

point of excellence is the avoidance of all hammering in of the pin, and the entire taking up of all lost motion by the nut. The eccentric pin cut on the end of the

advantages claimed by the makers for this over the old method are as follows: Barrels or cans of oil can be stored in the cellar or outbuilding and connected with the

pump by means of two pipes, one of which conveys the oil to the pump and the other returns the drip. One full turn of the crank measures exactly one-half pint, thus allowing the material to pass directly into the purchaser's can. The pump is hermetically sealed, avoiding disagreeable odors, occupies but 1 square foot of floor

Black Hawk Light Roadster.

Western Wheel Works, Chicago, Ill., for an 1893 machine are offering the Black Hawk Light Roadster, as shown herewith. This is referred to as a strictly high-grade wheel, with 28-inch wheels, $1\frac{1}{4}$ inch pneumatic tires, scorcher pattern handle

Pressed-Steel Pans.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, are manufacturing these pans, as shown herewith. The pan is stamped from one sheet of steel, and the flange or top edge of the pan is turned over a $\frac{5}{16}$ -inch steel rod, stiffening



Black Hawk Light Roadster.

space and can be placed where most convenient. Emphasis is laid on the reduction of fire risks to a minimum by its use.

Hilts' Adjustable Chain-Pipe Wrench.

E. F. Keating, 75 John street, New York, is introducing the above wrench for the Roll Paper Cutter Company, Richford, N. Y., as shown herewith. The wrench has a traveling handle, so that after the chain has been passed around the pipe and fastened, one turn of the handle will take up the slack in the chain. The grip on the pipe is immediate, thus giving maximum results in minimum space and time. The wrench has a ratchet motion, and can be removed from the pipe without having to raise or lower the handle. It is well adapted for working in contracted places. The point is made the ordinary chain wrench has been considered powerful and practical, the difficulty with it

bar, scorcher pattern saddle, geared to 63 inches; leg measure, 28 to 34 inches. The tire is made expressly for the company and is securely cemented on the tangent spoke wheels. These have extra light spokes

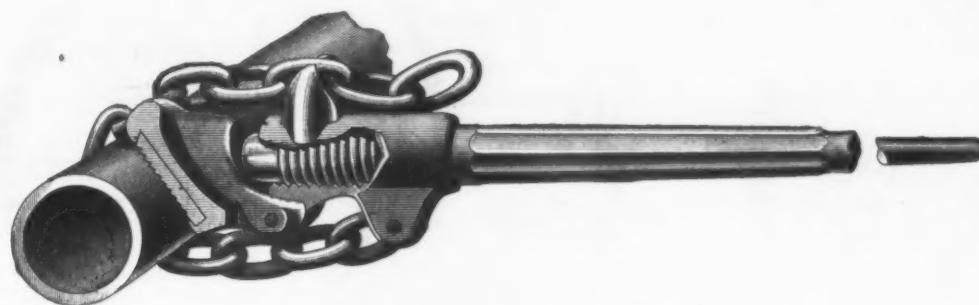
and strengthening it and giving a smooth finish. The handles are of $\frac{3}{4}$ inch round iron, and drop down against the sides of the pan when not in use. The pans are designed for use in bolt, rivet and screw



Pressed-Steel Pan.

and hubs nickel plated, and light steel rims enameled. The frame is of diamond pattern, made of light weight seamless steel tubing throughout, with extra long base and steering head, and a front fork especially designed for this machine. The

factories, machine shops, &c., under lathes and kindred machinery, to catch the turnings, trimmings and borings from the tools. The smaller sizes are adapted to handling small castings, bolts, rivets, &c., in process of manufacture, from one machine to



Hilts' Adjustable Chain-Pipe Wrench.

being the lost motion required to grip the pipe. This difficulty, it is claimed, is entirely overcome in this wrench. The wrench is made in six sizes, for pipe from 1 inch to 16 inches, with lever from 26 inches to 80 inches in length.

A colony is being formed in Cincinnati with the object of establishing an agricultural community in Nicaragua.

balls for the bearings are carefully selected and gauged and run in tempered steel-bearing bushings, adjusted by improved tempered steel cones; each and every bearing, it is stated, is absolutely dust proof. The pedals are ball-bearing, made from cold-rolled sheet steel and steel drop forgings, fitted with large square rubbers. The cranks are round, of forged steel, tapered, having a 7-inch throw. The weight of the wheel is 30 pounds.

another. The point is made that these pans are much more desirable and convenient than wooden boxes, or sheet iron trays bent up and riveted, for such purposes.

THE STARR-GRIFFIN HARDWARE COMPANY, Eugene, Ore., has been dissolved, J. F. Starr retiring from the firm. Mr. Starr has not announced his future intentions, and will for the present devote himself

to settling up the business of the old firm. G. P. Griffin has purchased Mr. Starr's interest in the firm, and will continue the business at the old stand under the style of the Griffin Hardware Company.

Avery's Never-Leak Steel Hods.

The accompanying illustrations represent hods manufactured by the Avery Steel Mfg. Company, Forty-third street and Stewart avenue, Chicago. The hods are



Fig. 1.—Never-Leak Steel Mortar Hod.

made from one piece of 18-gauge steel, reinforced on the edges and at the dumping point, the ends of the bodies being fastened together by a peculiar method. The fork and shoulder saddle, as shown in Fig. 1, is of malleable iron, to which cloth may be attached if desired, on the under side



Fig. 2.—Mortar Hod with Wrought-Iron Fork.

of the saddle. The socket is arranged to hold the hardwood handle, and to take up any shrinkage; or to replace a broken handle. In Fig. 2 the forks are made of wrought iron and the shoulder saddle of



Fig. 3.—Steel Brick Hod.

wood, these being attached to the body of the hod, as shown in the illustration. Hardwood handles are also used with this hod, and broken handles may be replaced. The manufacturers claim that the hods are water tight, and are 25 to 50 per cent. lighter, when in use, than the common wooden hod; also, that the malleable iron

fork and shoulder saddle make it easier for the user to carry. The brick hod shown in Fig. 3 is made with malleable-iron fork and shoulder saddle, also with wrought-iron fork and wood saddle, as in Fig. 2. The hods are furnished either black or galvanized, and are shipped knocked down.

side seams, and breast and bottom are offset, forming shoulders upon which the body rests. The shoulder on the bottom is designed to give support to the inside hoops and the body, making it, it is stated,

Electric Chafing Dish.

In the accompanying illustration is presented a general view of a nickel-plated chafing dish designed to be heated by electricity, which has just been introduced to the trade by the Carpenter Electric Heating Mfg. Company of St. Paul, Minn. This cooking utensil is made in a very substantial manner, having a cast-iron bottom plate and a body of heavy spun copper. The bottom plate is lined with asbestos felt, which protects the enamel in all cases, and is also fitted with a waterproof nickel plated connection which is interchangeable, being the same size for all nickel plated goods made by the company. The capacity of this article is said to be 1 quart, and will boil a pint of water in 9 minutes and a quart in 12 minutes. It consumes, according to the manufacturers' statement, from 4 to 5 am-

peres on 110 volts and 8 to 10 ampères on 50 volta. The device can be used, we understand, on any electric-light wire which may be in the house.



Fig. 2.—Body of Milk Can.



General View of Chafing Dish Heated by Electricity.

ampères on 110 volts and 8 to 10 ampères on 50 volta. The device can be used, we understand, on any electric-light wire which may be in the house.

completely around a reinforcing half-round rod, the whole overlapping the edge of the body. The cans are furnished made up, or the stock complete, with the bodies squared and punched, to be constructed in

New Pattern Milk Can.

Sidney Shepard & Co., Buffalo, N. Y., are putting on the market the can shown



Fig. 1.—New Pattern Milk Can.

in Fig. 1. In putting the parts together, Figs. 2 and 3, the body is riveted in the



Fig. 3.—Breast and Bottom.

the tin shop. The can is especially designed to supply the demand for a cheaper can than their Buffalo milk can. The manufacturers remark, however, that by means of patent devices they have been able to secure a strength and resistance which renders this can unusually serviceable.

THE CONNECTICUT SCREW COMPANY, Waterbury, Conn., who have recently been organized, will manufacture Brass, Copper and Iron Rivets and Burrs, as well as Brass and Iron Machine Screws for the electrical trade. Special Screws will also be made to order.

Hartz's Steel Tackle Blocks.

H. D. Edwards & Co., 16-24 Woodward avenue, Detroit, Mich., are sole agents for the Hartz block, illustrations of which are shown in the accompanying cuts. The shells of the blocks are of wrought steel. The straps run on the inside of the shell



Fig. 1.—The Hartz Steel Tackle Block.

and through to the becket in all sizes larger than 6-inch, and in smaller sizes to and including the pin. There are no outside nuts or bolt heads to disfigure the shell or entangle in the rope. The steel pin is flattened on one side at the end opposite the head so that it cannot turn, and the same end is slotted and is easily spread with a cold chisel so that it will not work out. The block shown in Fig. 1



Fig. 2.—Section of Cheek.

is the regular mortise block with plain bushing. All these blocks, up to and including 10-inch, have the same score as wide mortise blocks, and take the same size of rope. The plain, roller bushed and graphite bronze self lubricating sheaves fit into the same shell and are interchangeable. Fig. 2 shows a section of the cheek, and Fig. 3 of the connection between the plate and cheek. The blocks are japanned, which is referred to as more durable than a coat of paint, and every block is warranted. This block is made single, double and triple. The automatic wrought-iron and steel lock snatch block, Fig. 4, is fitted



Fig. 3.—Section of Connection.

with self-lubricating graphite bronze bushing, upon which no oil is used. The heavy strap goes completely around the whole block, and inside the shell, rendering the block, it is stated, practically unbreakable. The gin or wire rope block, Fig. 5, is fitted with graphite bronze bushings requiring no oil, and is made, it is stated, of the best grades of iron, with

turned steel pins and roller guards, guaranteeing perfect protection to the rope. It is remarked that these blocks are light,

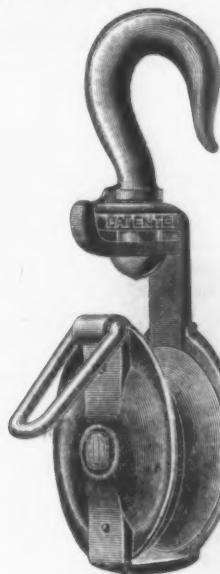


Fig. 4.—The Hartz Lock Snatch Block.

strong and cheap. Various styles of blocks besides those illustrated are manufactured, with plain, self adjusting steel roller and self-lubricating graphite bronze bushings;

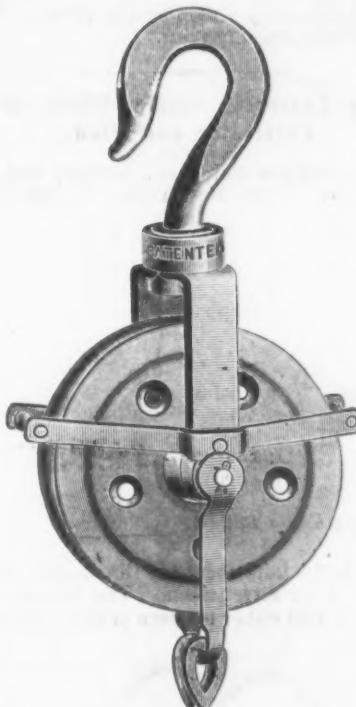


Fig. 5.—Hartz Gin Block.

some blocks being japanned and others galvanized. The manufacturers claim for these goods that they are light, strong and handsome, and that they are sold at about the same price as the ordinary wooden block.

Herrick's Tool Brackets.

Brackets for hanging tools, as shown in Fig. 1, are being introduced by F. A.



Fig. 1.—Herrick's Tool Bracket.

Herrick & Co., 228 Second street, Jackson, Mich. The brackets are made of cast iron, notched so that each tool is secure gaskets, &c. The little circular gives illustrations of the goods with prices and full lists of sizes.

Improved Acme Steam Jacketed Kettle.

The kettle herewith illustrated is manufactured by the Stuart & Peterson Company, Philadelphia, Pa., which embodies

spiration, wet with rain, greasy, or covered with gloves. The company have not entirely discarded the knurled ring, as it is preferred by some dealers, being somewhat cheaper than the corrugated. Another improvement with which their braces

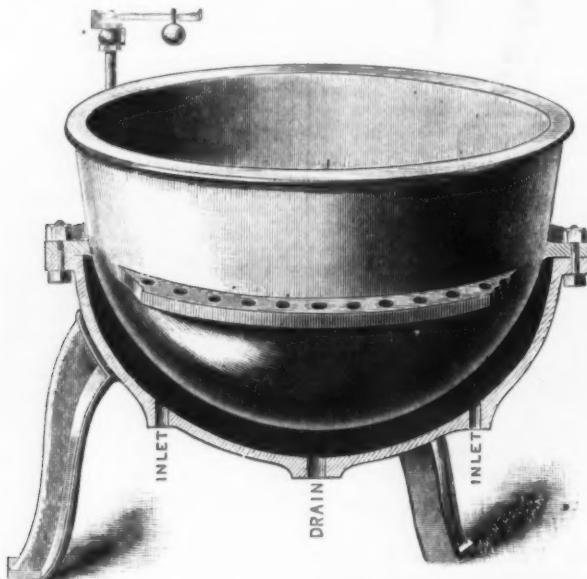


Fig. 1.—Improved Acme Steam-Jacketed Kettle.

improvements for this class of kettles. The point is made that the boiling commences midway or near the bottom, resulting in uniformity of the boiling process, obviating the boiling at the top and boiling over with other unsatisfactory results. The kettles are furnished with or without safety valves, the valve cut off to 60 pounds. The kettle is cut away in

are equipped is a stop lock to prevent the jaws from dropping out.

New Universal Single Wheel Hoe, Cultivator and Plow.

Ames Plow Company, Boston, and 53 Beekman street, New York, are offering

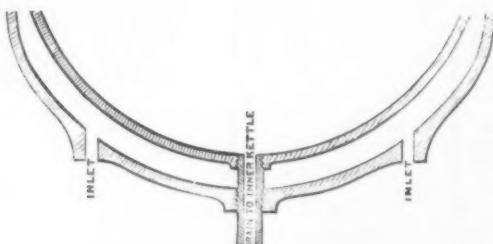


Fig. 2.—Sectional View of the Kettle Bottom.

Fig. 1, showing the interior construction and the height of the jacket, while Fig. 2 gives a sectional view. The kettles are designed for the use of butchers, canners, chemists, confectioners, curriers, hotels, paper manufacturers, printers, public institutions, soap manufacturers, varnish makers, &c., and are made in 10, 18, 24, 48 and 52 gallon sizes.

Improvements in Bit Braces.

The American Bit Brace & Tool Company, Buffalo, N. Y., have devised an improvement in the surface form of ratchet rings for adjusting the ratchet on bit braces. It is in form of the serrated, corrugated, hexagon, octagon and other similar shaped surfaces for the ring. They have about concluded to adopt the corrugated form as the standard, as it gives a better appearance to the brace than the other shapes. They will, however, be prepared to furnish the other shapes if necessary. The object of this form of ring is to prevent the fingers of the workmen from slipping and to make the grip more firm and secure, which, it is stated, it accomplishes much better than a knurled ring when the hands are damp from per-

this hand implement, as illustrated herewith, with attachments. The implement can be used either between or astride rows,



New Universal Single-Wheel Hoe, Cultivator and Plow.

although it is intended for a between-row cultivator. For a straddle cultivator the

wheel can be set to one side so as to bring

ment has already been purchased in this country and the roadbed is being graded to receive it.

Lindner's Stock Salter.

Snead & Bibb, 710 Fourteenth street, Louisville, Ky., are offering this salter, an illustration of which is given in the accompanying cut. It is designed to nail up in the stall at a convenient height to be within easy reach for the animal to lick, and may also be attached to a post or tree in a yard or pasture. It is cylindrical in shape, having no corners or projecting points of any kind. It is stated that the preparation



Lindner's Stock Salter.

contains none of the impurities of rock salt, and that the use of this article assures animals the correct quantity of salt at all times.

No. 4 Factory Broom.

The description which accompanied the illustration of the No. 4 factory broom, made by Joseph Lay & Co., Ridgeville, Ind., in our issue of January 28, 1893, was misleading, as the factory broom is made of all broom corn, especially for the lighter work in cotton, woolen, knitting and cloth mills. The description given applied to their No. 4 rattan mixed broom, which is made of corn and rattan mixed, flat in shape and bound with an iron band.

The Manganese ore mines on the northern coast of the Isthmus of Panama, about 40 miles from Colon, are being opened by an American company in which the Carnegie Steel Company and the Illinois Steel Company are reported to be interested. Preparations are being made for the erection of a shipping dock. About 7 miles of narrow-gauge track will be laid to connect the mines with the dock. The equip-

Chalk Lines —See Lines.
Chisels —
Socket Framing and Firmer
P. S. & W. New Haven.
Witherby.
Ohio Tool Co.
Douglas.
Buck Bros.
Merrill.
L. & J. White.
Tanged and Miscellaneous.
Tanged Firmers.
Butchers'
Spear & Jackson s.
Buck Chisel.
Cold Chisel, P. D.
Chucks —
Beach Pat. each, \$8.00.
Morse's Adjustable, each, \$7.00.
Danbury. each, \$6.00.
Syracuse, Balz Pat.
Graham Patent.
Skinner's Patent Chucks.
Combination Lathe Chucks.
Universal Lathe Chucks.
Independent Lathe Chucks.
Drill Chucks.
Union Mfg. Co.
Victor.
Combination.
Universal.
Independent.
Churns —
Tiffin Union, each, 5 gal. \$3.25; 7 gal., \$3.75; 10 gal. \$4.25.
McDonald Star Barrel Churn, each 6 gal., \$2.00; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.
Clamps —
R. L. Tool Co.'s Wrought Iron.
Adjustable, Cincinnati.
Adjustable, Hammers.
Adjustable, Stearn's.
Steam's Adjustable Cabinet and Corner.
Cabinet, Sargent's.
Carriage Makers', P. S. & W. Co.
Eberhard Mfg. Co.
Warner's.
Saw Clamps, see Vises, Saw Fliers.
Carpenter's, Cincinnati.
Cleavers, Butchers' —
Bradley s.
L. & J. W. White.
Beatty's.
New Haven Edge Tool Co.'s.
P. S. & W.
Foster Bros.
Schulte, Lohoff & Co.
Clips —
Norway, Axle, 14 & 16.
2d grade Norway Axle, 14 & 16.
Superior Axle Clips.
Norway Spring Bar Clips, 6-16.
Wrought Iron Felloci Clips.
Steel Felloci Clips.
Baker Axle Clips.
Cloth and Netting, Wire — —See Wire, dc.
Cockeyes —
Cocks Brass—
Hardware list.
Coffee Mills —See Mills, Coffee.
Collars, Dog —
Chapman Mfg. Company.
Medford Fancy Goods Co.
Embossed, Gilt, Pope & Steven's list, 30 & 10%.
Leather, Pope & Steven's list.
Brass, Pope & Steven's list.
Combs, Curry —
Fitch's.
Rubber per doz. \$10.00.
American Curry Comb Co.
Kohler's Magno Oscillating.
Kohler's Humane.
Compasses, Dividers, &c.
Compasses, Calipers, Dividers.
Bensis & Call Co.'s
Dividers.
Compasses.
Calipers, Wing and Inside or Outside.
Calipers, Double.
Calipers, Call's Patent Inside.
Excelsior.
J. Stevens & Co.'s.
Starrett's
Spring Calipers and Dividers.
Lock Calipers and Dividers.
Combination Dividers.
Coopers' Tools — —See Tools, Coopers'.
Cord —
Sash—
Common. P. D. 10 & 11%.
Patent, good quality. P. D. 12 & 12%.
White Cotton Braided, fair. P. D. 24 & @ 13%.
Common Russia Sash. P. D. 14 & @ 13%.
Patent Russia Sash. P. D. 14.
Cable Laid India Sash. P. D. 21 & 22%.
India Cable Laid Sash. P. D. 21.
Silver Lake—
A quality, White, 50¢.
A quality, Drab, 55¢.
B quality, White, 30¢.
B quality, Drab, 35¢.
Sylvan Spring, Extra Braided, White.
Sylvan Spring, Extra Braided, Drab.
Semper Idem, Braided, White.
Egyptian, India Hemp, Braided.
Massachusetts, White.
Samson—
Braided, White Cotton. P. D. 37¢.
Braided, Drab Cotton. P. D. 42¢.
Braided, Italian Hemp. P. D. 40¢.
Braided, Linen. P. D. 50¢.
Tate's Solid Braided—
Hercules, White. P. D. 25¢.
Hercules, Drab. P. D. 30¢.
Economy, Drab. P. D. 27¢.
Economy, White. P. D. 32¢.
Oswann Mills—
Braided, Giant, White, P. D. 30¢.
Braided, Giant, Drab and Fancy, P. D. 35¢.
Drill Chucks —See Chucks.
Dripping Pans — —See Pans, Dripping.
Drivers, Screw —
Douglas Mfg. Co.
Diastors.
Buck Bros.
Stanley R. & L. Co.'s
No. 64, Varnished Handles.
No. 66.
Sargent & Co.'s
No. 1, Forged Blade.
Nos. 20, 40 and 60.
P. S. & W.
Knapp & Cowles
No. 1.
No. 2.
No. 3.
Nos. 4 and 60, Acme and Ideal.
50 & 60¢.
Stearns'
Gay & Parsons
Champion.
Clark's Pat.
Crawford's Adjustable.
Erlrich's Socket and Ratchet.
Allard's Spiral, new list.
Koll's Common Sense. P. D. 60¢.
Syracuse Screw-Driver Bits.
Screw Driver Bits.
Screw Driver Bits, Parr's. P. gross.
Fray's Hot, H'dle Sets. No. 3. \$12.00.
P. D. & Co.'s All Steel.
Cincinnati.
Brace Screw Drivers.
Buck Bros.' Screw Driver Bits.
Goodell's Automatic.
Mayhew's Black Handle.
Mayhew's Monarch.
C. T. Williamson Wire Novelty Co.
Egg Beaters —See Beaters, Egg.
Egg Poachers — —See Poachers, Egg.
Electric Bell Sets — —See Bells, Electric.
Emery —No. 4 to No. 54 to Flour, C.F.
46 gr. 150 gr. F.F.F.
Kegs, P. D. 44¢ 5¢ 24¢
14 kgs, P. D. 14¢ 5¢ 24¢
14 kgs, P. D. 5¢ 5¢ 24¢
10-15 cans, 10 in case. 6¢ 6¢ 5¢
10-15 cans, less than 10. 10¢ 10¢ 7¢
Enamelled and Tinned
Ware —See Ware, Hollow.
Escutcheon Pins — —See Pins, Escutcheon.
Escutcheons —
Door Lock. Same dis. as Door Locks.
Brass Thread.
Wood.
Expanded Metal — List No. 5.
Lathing.
Fencing, Painted Sheets.
Netting, Painted Sheets.
Door Mats, Galvanized.
Window Guards, Panelled.
Tire Guards, Panelled.
Dampers, &c. —
Dampers, Buffalo.
Buffalo Damper Clips.
Crown Damper.
Excelsior.
Diggers, Post Hole, &c. —
Samson. P. D. 34.00.
25 & 25 & 10%.
Fletcher Post Hole Augers, P. D. 36.00.
20 & 20 & 10%.
Eureka Diggers. P. D. 12.00.
13.00.
Vaughan's Post Hole Auger. P. D.
\$8.50 & \$9.50
Kohler's Little Giant. P. D. 18.00.
Kohler's Hercules. P. D. 14.00.
Kohler's Invincible. P. D. 12.00.
Kohler's New Champion. P. D. 8.00.
Scheidler. P. D. 18.00.
Cronk's Post Bars, P. D. 30.00.
50 & 50 & 50 & 10%.
Gibb's Post Hole Digger. P. D. 15.00.
Gibb's National. P. D. 12.00.
Gibb's Columbia. P. D. 13.00.
Gibb's Imperial. P. D. 37.50.
Shimer's Hollow Handle. P. D. 24.00.
50¢.
Dividers —See Compases.
Dog Collars —See Collars, Dog.
Door Springs — —See Springs, Door.
Drawers .
Money, P. D.
\$18 & \$20
Drawing Knives — —See Knives, Drawing.
Drills and Drill Stocks —
Blacksmiths'. each \$1.75.
Blacksmiths' Self-Feeding, each \$7.50, 20%.
Breast, P. S. & W.
Breast, Wilson's.
Breast, Millers Falls. each \$3.00, 25%.
Breast, Bartholomew's. each \$2.50.
25 & 10 & 10%.
Ratchet, Merrill's.
Ratchet, Ingersoll's.
Ratchet, Parker's.
Ratchet, Whitney's.
Ratchet, Weston's.
Ratchet, Moore's Triple Action.
Ratchet, Curtis & Curtis'.
Wright's Hand Drill, Plain. \$11.00.
Adjustable @ 12.00.
20 & 20 & 10%.
Wilson's Drill Stocks.
Automatic Boring Tools. \$1.75 & \$1.85.
Chicago Automatic Drill.
20 & 20 & 10%.
Twist Drills —
Cleveland. P. D. 10 & 10%.
Diamond, W. & B.
Graham's Pat. Groove Shank.
Morse.
New Process.
Standard.
50 & 10 & 10%.
Syracuse (Meta list).
50 & 10%.
Drill Bits or Bit Stock —
Drills—See Augers and Bits.
Fixtures, Grindstone —
Sargent's Patent.
Heading Hardware Co.
P. S. & W. Co.
Fluting Machines — —See Machines, Fluting.
Fluting Scissors — —See Scissors, Fluting.
Fodder Squeezers — —See Squeezers, Fodder.
Forks —
Hay, Manure, &c. Asso. List.
70 & 70 & 10%.
Hay, Manure, &c. Phila. List.
60 & 60 & 10%.
Plated, see Spoons.
Frames —
Saw —
White Vermont. P. gross. \$9.00 & \$10.00.
Red, Polished and Varnished. P. doz.
\$1.50, 25¢.
Screen, Window and Door —
Porter's Pat. Window and Door Frame.
33 & 34 & 10%.
Warner's Screen Corner Irons.
33 & 34 & 10%.
Stearns' Frames and Corners.
25 & 25 & 10%.
Cortland.
10 & 10%.
Freezers, Ice Cream —
White Mountain.
Granite State.
Arctic.
American.
Buffalo Champion.
Shepard's Lightning.
Gem.
Blizzard.
Double Action Crown.
Crown.
Star.
Peerless.
Giant.
Zero.
Boss and Pet.
Keystone, P. D. & Co. each, \$1.50.
Standard.
Standard Double Action.
Expert.
Model.
Confectioners' Machine.
Fruit and Jelly Presses — —See Presses, Fruit and Jelly.
Fry Pans —See Pans, Fry.
Funnels —
Gersdorff's Perfection, Standard and Globe. Tin, 1 gro. 10%; 2 to 5 gro. 20%.
20% to 10 gro.
Copper, 1 to 6 doz. 15%; to 12 doz. 20%; over 12 doz.
Furnaces, Soldering —
Burgess No. 3 Gem tin reservoir. \$7.00.
Burgess No. 3 Gem, Copper reservoir. \$5.50.
Fuse —Dis. 12¢ & 15¢. P. gross.
Common Hemp Fuse, for dry ground. 2.25¢.
Single Taped Fuse, for wet ground. 3.25¢.
Double Taped Fuse, for very wet gr. 4.25¢.
Triple Taped Fuse, for very wet gr. 5.00¢.
Small Gutta Percha Fuse, for water. 7.50¢.
Large Gutta Percha Fuse, for water. 12.00¢.
Gates Molasses —
Stebbin's Pattern.
Stebbin's Genuine.
Stebbin's Tinned Ends.
Chase's Hard Metal.
Bush's.
Lincoln's Pattern.
Weld's.
Boss' doz.
No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4, \$10.
Gauges —
Marking Mortise, &c.
Starrett's Surface, Center and Scratch.
25 & 10%.
Fasteners, Blind —
Mackrell's. P. D. \$1.00.
20 & 20 & 10%.
Van Sand's Screw Pat. 15¢ P. gr.
20 & 20 & 10%.
Van Sand's Old Pat. 15¢ P. gr.
55 & 10%.
Austin & Eddy No. 2008. P. gr.
\$9.00.
Zimmerman's.
60 & 10%.
Faucets —
Fenn's.
Boehren's Pat. Rubber Ball.
25¢.
Fenn's Cork Stop.
33¢.
Star.
Frary's Pat. Petroleum.
B. & L. B. Co.
West's Lock, Open and Shut Key.
Star, Metal Plug, new list.
Lockport, Metal Plug, reduced list.
Metallic Key, Leather Lined.
60 & 10 & 10%.
Cork Lined.
70¢ & 70 & 10%.
Burnside's Red Cedar.
50¢.
Burnside's Red Cedar, bbl. lots.
50 & 10%.
Horn Sommers'.
Peerless Best Block Tin Key.
40%.
IXL, 1st quality, Cork Lined.
50%.
Diamond Lock.
40%.
Perfection, Fl. Red Cedar (in boxes) 10%.
Boss Metallic Key.
50%.
Reliable Cork Lined.
50%.
O. K. Western Pattern Cork Lined.
50%.
No Brand, Red Cedar (in bbls.).
50 & 20%.
Western Pattern Metal Key.
40%.
No Brand Metal Key.
50%.
Self Measuring.
Enterprise, P. D. \$36.00.
20%.
Lane's P. D. \$36.00.
25 & 10%.
Victor. P. D. \$36.00.
25 & 10%.
Felloc Plates — —See Plates, Felloc.
Fibre Ware —See Ware Fibre.
Fifth Wheels —
Derby and Cincinnati.
45 & 5%.
Brewster.
50 & 5%.
Files —
Domestic —
Nicholson Files, Rasps, &c. 60 & 10 & 10%.
Nicholson (X.F.) Files.
60 & 10 & 10%.
Nicholson's Royal Files (Seconds).
75¢.
(extra prices on certain sizes).
G. & H. Barnett (Black Diamond).
60 & 10 & 10 & 10%.
Arcade.
60 & 10 & 10 & 10%.
Eagle.
60 & 10 & 10 & 10%.
Other makers, best bran's.
60 & 10 & 10 & 10%.
Fair brands.
70¢ & 70 & 10%.
Second quality.
70¢ & 70 & 10%.
Heller's Horse Rasps.
50¢ & 50¢.
McCaffrey's Horse Rasps.
50¢ & 50¢.
Chester's Horse Rasps, Hand Cut.
50 & 10%.
Arcade Horse Rasps.
60 & 10 & 60 & 10 & 10%.
Imported —
Butcher.
Butcher's list.
Stubas.
Stubas lat. 25¢ & 30¢.
Grindstone Fixtures — —See Fixtures, Grindstone.
Gun Powder —See Powder.
Hack Saws —See Saws.
Hawks, Awl —
Sewing, Brass Fer. P. gr.
Pat. Sewing, Short.
Pat. Sewing, Long.
5¢ gross.
Pat. Peg, Plain Top.
40¢ & 45¢.
Pat. Peg, Leather Top.
40¢ & 45¢.

Halters—

Covert's, Rope, Jute..... 60&10&10&2%
Covert's Rope, 7-16-in., Jute..... 70&2%
Covert's Rope, 1/2-in., Hemp..... 60&2%
Covert's Adj. Rope Halters..... 40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties..... 70&2%
Covert's Jute Cattle Ties..... 70&2%
Covert's Adj. Web Halters..... 35&5&2%
Covert's Saddlery Works Halters..... 33&4%
Covert's Saddlery Works Horse and Cattle Ties..... 33&4%

Hammers—**Handled Hammers—**

Maypole's, list Dec. 1, '85..... 25&10&35%
Buffalo Hammer Co.
Humason & Beckley 50&10%
Atha Tool Co.
Verree.....
C. Hammond & Son. 40&10&—%
Fayette R. Plumb.
Artisan's Choice, A. E. Nall. 40&10%
Regular Y. & P. A. E. Nall. 50%
Horseshoe Turning Hammers..... 50%
Other Hammers..... 50&10%
Cheney's Claw..... 40&10%
Cheney's Machinist & Riveting..... 50&5%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75..... 30&10%
Nelson Tool Works..... 40&10%
Warner & Nobles, new list..... 25&10%
Peck, Stow & Wilcox. 35&40%
Sargent's..... 40&40&10%

Heavy Hammers and Sledges—

8 lb and under.... 25&40%
8 to 5 lb.... 25&36%
Over 5 lb.... 25&30%
Wilkinson's Smiths..... 10&4&11&7%

Handcuffs and Leg Irons—

—See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins' new list..... 40%
Champion..... 15%
Ely's Perfection..... 25&10%

Iron, Wrought or Cast—

Door or Thumb.
Nos. 0 1 2 3 4
Per doz.... \$0.90 1.00 1.08 1.35 1.50
60&10&10%
Roggan's Latches..... 25&30%
Bronze Iron Drop Latches. 25&30% net
Jap'd Store Door Handles—Nuts, \$1.62;
Plate, \$1.10; no plate, \$0.88..... net
Barn Door, \$ per doz \$1.40..... 10&10%
Chest and Lifting..... 70&70&10%

Wood—

Saw and Plane..... 40&10&50%
Hammer, Hatchet, Axe, &c. 40&40&5%
Brad Awl..... 25&30%
Hickory Firmer Chisel, ass'd. gr 4.50
Hickory Firmer Chisel, large.... gr 5.00
Apple Firmer Chisel, ass'd. gr 5.00
Apple Firmer Chisel, large.... gr 6.00
Socket Firmer Chisel, ass'd. gr 3.00
Socket Framing Chisel, ass'd. gr 5.00
J. B. Smith & Co.'s Fat File..... 50%
File, assorted..... gr 2.75%
Auger, assorted..... gr 5.00..... 50%
Auger, large..... gr 7.00%
Pat. Auger, Ives..... 30&10%
Pat. Auger, Douglass..... 25&10%
Pat. Auger, Swan's..... 25&10%
Hoe, Rake, Shovel, &c. 60&60&5%

Hangers—

Barn Door, old patterns..... 70&70&5%
Barn Door, New England..... 70&70&5%
Samson Steel Anti-Friction..... 55%
Orleans Steel..... 55%
Hamilton Wrought Steel Track..... 55%
Climax Anti-Friction..... 55%
Zenith for Wood Track..... 55%
sterling..... 50&10&10%
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00..... 50&2%
Cheritree..... 50&8&10%
Klitter's..... 50&50&10%
Boss..... 60&10&60&10&5%
Best Anti-Friction..... 60&10&60&10&5%
Duplex (Wood Track). 60&10&50%
Terry's Modern..... 50&10&50&10&5%
Terry's Ideal..... 50&10&50&10&5%
Terry's Solid..... 50&10&60%
Terry's Shield..... 50&10&60%
Terry's Wrought Single Strap..... 50&10%
Cronk's Patent, Steel Covered..... 50&10%
Carrier Steel Anti-Friction..... 50&10%
Richards..... 30&30&10%
Lane's New Standard..... 50&50&5%
Lane's Standard..... 50&50&5%
Lane's Parlor..... 40%
Warner's Pat. 20&10&10%
Stearns' Anti-Friction..... 20&10&10%
Stearns' Challenge..... 25&10&10%
Cincinnati, Nos. 1, \$2.25; 2, \$2.50; 4, \$2.5.

Paragon, Nos. 5, \$2.50; 7 and 8, \$2.10&10%
Crescent..... 60&60&10&10%
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15.

Chicago Anti-Friction..... 30&10%
star..... 40&10&40&8&10&5%

Barry..... 50%
Interstate..... 50&10&60%

Pendulum, Payson's..... 40&10&10%
Woolley.....

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.
Blood's.
Hunt's.
Hurd's.
Mann's.
Peck's.
Underhill's.
Buffalo Hammer Co. @
Fayette R. Plumb. 50&5%

C. Hammond & Son.
Kelly's.
Sargent's & Co.
P. S. & W. Co.
Ten Eyck Edge Tool Co.
Collins. 10%
Schulte, Lohoff & Co. 50&50&5%

Hay and Straw Knives—**See Knives.****Hinges—****Blind Hinges—**

Parker..... 75&2%
Huffer..... 50%
Clark's, Nos. 1, 3, 5, 10 and 20, \$0.80&8&5%
Clark's Mortise Gravity..... 50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13, 75&10&10%
Reading's Gravity..... 75&10&10&5%
Shepard's.
Noiseless..... 75&10%
Niagara..... 80%
Buffalo..... 80%
Clark's Genuine Pattern..... 80%
O. S. Lull & Porter. 75&10%
Acme, Lull & Porter. 75%
Queen City Reversible..... 70&10&8&5%
Clark's, Lull & Porter, Nos. 0, 1, 16, 2, 24, 3, 75&10&8&5%
North's Automatic Blind Fixtures, No. 2, for Wood, \$0.00; No. 3, for Brick, \$1.50. 10%

Gate Hinges—

Western..... \$ per doz \$4.20, 60&60&10%
N. E. \$ per doz \$7.80, 60&60&10%
N. E. Reversible \$ per doz, \$5.60, 60&60&10%
Clark's, Nos. 1, 2, 3, 5, 10 and 20, \$0.80&8&5%
N. Y. State..... \$ per doz \$4.90, 60&60&10%
Automatic..... \$ per doz \$12.50, 50%
Shepard's. 50&10&5%

Spring Hinges—

Geer's Spring and Blank Butts, 40%
Union Spring Hinge Co.'s list, March, 1886.
Barker's Double Acting..... 25%
Union Mfg. Co. 25%
Bommer's..... 30%
Buckman's. 15&20%
Chicago..... 30%
Bardsley's Patent Checking..... 15%
Acme. 30%
U. S. 25&10%
Empire and Crown..... 20%
Hero and Monarch..... 55%
American, Gem and Star..... 20%
Royal. 20%
Reliable. 60%
Champion. 60%
No. 10 Matchless. 60%
No. 25 Unbreakable. 60%
J. G. C. Covered, \$ per gro., \$30. 50&5%
Samson. 60&60&5%
Wiles', No. 1, \$ per gro., \$16; No. 2, \$20. 50&6%
Devore, No. 1, \$ per gro., \$18.00
Rex. \$ per gro., \$13.00
Freeport. \$ per gro., \$12.00

Wrought Iron Hinges—

List February 14, 1891.
List and T. 50&10&50&10&5%
Corrugated Strap and T. 50&10&5%
Screw Hook and T. 6 to 12 in., \$ per doz. 4%
Strap. 1 to 20 in., \$ per doz. 3%
2 to 36 in., \$ per doz. 3%
Screw Hook and Eye. 14 in., \$ per doz. 7%
1/4 in., \$ per doz. 5%
1/4 in., \$ per doz. 4%
Rolled Blind Hinges, Nos. 32 and 34. 50&10%
Rolled Blind Hinges, Nos. 22 and 24. 50&10%
Rolled Plate. 55&10%
Rolled Raised. 70&10%
Plate Hinges 8, 10 and 12 in., \$ per doz. 5%
Providence "I" over 12 in., \$ per doz. 4%
From 4 to 10, at factory.... \$ per doz. 100%
Self-Heating. \$ per doz \$2.40
Self-Heating Tailors'. \$ per doz \$18.00
Enterprise Irons, list Jan. 17, '89. 30%
Crown. 60&10&60&10&5%
Ideal Irons, new list. 50&10&50&10&5%
Salamander Irons. 25%
S. B. Sad Irons, \$ per doz. 3/4¢
Combined Fluter and Sad Iron, \$ per doz. 15%
Fox Reversible Self-Fluter, \$ per doz. 24.00
Chinese Laundry (N.E. Butt Co.), \$ per doz. 15%
New England. 64.15%
Mahony's Troy Pol. Irons. 25%
Sensitive, list Jan. 91. 50&10&5%
Sensitive Tailor's Irons. 33&4%
National Self-Heating. 30%

Hoes—

D. & H. Scovil. 20%
Lane's Crescent, Planters' Pattern. 45&5%
Lane's Razor Blade, Scovil Pattern. 30%
Maynard, S. & O. Pat. 45&5%
Sandusky Tool Co., S. & O. Pat. 5%
Am. Axe and Tool Co., S. & O. Pat. 5%
Grub. 60&10%
From 4 to 10, at factory.... \$ per doz. 100%
Self-Heating. \$ per doz \$2.40
Self-Heating Tailors'. \$ per doz \$18.00
Enterprise Irons, list Jan. 17, '89. 30%
Crown. 60&10&60&10&5%
Ideal Irons, new list. 50&10&50&10&5%
Salamander Irons. 25%
S. B. Sad Irons, \$ per doz. 3/4¢
Combined Fluter and Sad Iron, \$ per doz. 15%
Fox Reversible Self-Fluter, \$ per doz. 24.00
Chinese Laundry (N.E. Butt Co.), \$ per doz. 15%
New England. 64.15%
Mahony's Troy Pol. Irons. 25%
Sensitive, list Jan. 91. 50&10&5%
Sensitive Tailor's Irons. 33&4%
National Self-Heating. 30%

Handled—

Garden, Mortar, &c. 70&70&5&2%
Planter's, Cotton, &c. 70&70&5&2%
Warren Hoe. 60&60&5%
Magic. \$ per doz \$4.00

Hog Rings and Ringers—

See Rings and Ringers—

Hoisting Apparatus—

See Machines, Hoisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat. \$ per doz \$18.... 60%

Bit—

Extension. Barber's, \$ per doz \$15.00. 40&40&10%
Ives, \$ per doz \$20.00. 60&60&10&10%
Diagonal. \$ per doz \$24.00, 40&5%
Angular. \$ per doz \$24.00, 40&5%

File and Tool—

Balz Pat. \$ per doz \$4.00, 25%
Nicholson File Holders. 20%
Dick's Tool Holder. 20%

Hooks—

Bird Cage, Sargent's List. { 60&10&10%
Bird Cage, Reading. { 60&10&10%
Clothes Line, Sargent's list. { 60&10&10%

Clothes Line, Reading list.

60&10&60&10&10%
Ceiling, Sargent's List. 55&10&10%
Harness, Reading List. 55&10&10&10%
Coat and Hat, Sargent's List. 55&10&10&10%
Coat and Hat, Reading. 50&10&20&10&10%

Wrought Iron—

Cotton. \$ per doz \$1.25
Cotton Pat. (N. Y. Mallet and Handle Wks.). 30%
Tassel and Picture, T. & S. Mfg. Co. 50%
Wrought Staples, Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886. 50&10&10%
Wire Coat and Hat, Miles, list April, 1886. 50&10&10%
Wire Coat and Hat, Standard. 50&10&10&10%
Indestructible Coat and Hat. 45&5&10%
Wire Coat and Hat, Standard. 50&10&10&10%
Handy Hat and Coat. 50&10&10&10%
Sandy Ceiling Hooks. 50&10&10%
Beit. 80&10&80&80&20%
Atlas, Coat and Hat. 65%
Williamson's Bird Cage Hooks, List April, 1892. 40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grazes, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25
Nolin's Grass. \$ per doz \$2.25
Bush. 50&60%
Whiffetre Patent. 55%
Hooks and Eyes—Malleable Iron. 50&10&10%
Hooks and Eyes—Brass. 60&60&10%
Fish Hooks, American. 50&10&10%
Bench Hooks—See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition. 75&75&10&10%
Standard. 60&10&10&10%
Extra. 60&60&10%
N. Y. B. & P. Co., Para. 25&5%
N. Y. B. & P. Co., Extra. 40&40&5%
N. Y. B. & P. Co., Dundee. 50&10&60%

Huskers—

Baird's Adjustable. \$ per doz \$8.00
Baird's Adjustable Clipper. \$ per doz 7.00
Hubbard's Solid Steel. \$ per doz 4.50

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons—

Sad—

From 4 to 10, at factory.... \$ per doz. 100%
\$2.30 to \$2.40

Self-Heating. \$ per doz \$8.00

Self-Heating Tailors'. \$ per doz \$18.00

Enterprise Star Irons, list Jan. 17, '89. 30%

Crown. 60&10&60&10&5%

Ideal Irons, new list. 50&10&50&10&5%

Salamander Irons. 25%

S. B. Sad Irons, \$ per doz. 3/4¢

Combined Fluter and Sad Iron, \$ per doz. 15%

Fox Reversible Self-Fluter, \$ per doz. 24.00

Chinese Laundry (N.E. Butt Co.), \$ per doz. 15%

New England. 64.15%

Mahony's Troy Pol. Irons. 25%

Sensible, list Jan. 91. 50&10&5%

Sensible Tailor's Irons. 33&4%

National Self-Heating. 30%

Soldiering—

Soldering Coppers. \$ per doz \$19.25

Covert's Adjustable, list Jan. 1, 1886. 35&2%

35&2%

Pinking—

Pinking Irons, \$ per doz, 55&60%

Jacks, Wagon—

Daisy. 33&4%

Victor. 33&4%

Lockport. 10%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91. 25&5%

Brass, Spun, Pid. W. M. list Jan. 1, '91. 20% to 25%

Enameled and Tea—See Ware, Hollow.

Keys—

Lock, Ass'n list Dec. 30, 1886. 50&5%

Eagle, Cabinet, &c. 33&42%

Hochkins' Brass Blanks. 40%
Hochkins' Copper and Tinned. 40%
Hochkins' Pad. and Cab. 35%
Ratched Bed Keys. \$ per doz. 15%
Wollensak Tinned. 50&10&10%

Knife Sharpeners—

See Sharpener, Knife.

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, list Dec. 8, 1890. 25%

Ames' Butcher Knives. 25%

Foster Bros.' Butcher, &c. 40%
Jardine's AA Al Butchers', list. net

Nichols' Butcher Knives. 40&10%
W. W. Wilson, Butcher, 6 in. \$2.00; 7 in. \$2.70; 8 in. \$3.80, &c.

Ames' Shoe Knives. 20&25%

Ames' Bread Knives, \$ per doz \$1.50, 15&20%
Moran's Bread and Bread. 20&20&10%

Hay and Straw—See Hay Knives.

Hay and Pocket—See Cutlery.

Corn—

Brittan, Graham & Mathes, list Jan. 1890.
Perkins' Burglar Proof.
Plate.
Barnes Mfg. Co..
Tale.
Deits Flat Key.
L. & C. Round Key Latches.
L. & C. Flat Key Latches.
Romer's Night Latches.
Brooklyn Latches.
Shepardson or U. S..
Seed's N. Y. Hasp Lock.
Warner's Burglar Proof. F. doz. \$8.00. 50%

Padlocks—

List June 10, 1891.
Norwich Lock Mfg. Co., old list.
Yale Lock Mfg. Co.'s.
Eagle.
Eureka, Eagle Lock Co..
Romer's Nos. 0 to 91.
Romer's Scandinavian, &c., Nos. 100 to 500.
A. E. Deltz.
Champion Padlocks.
Hotchkiss.
Star.
Horseshoe.
Barnes Mfg. Co..
Nox's.
Brown's Pat..
Scandinavian.
Z. J. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.
Other Nos..
Ames Sword Co. up to No. 150.
Ames Sword Co. above No. 150.
Slaymaker, Barry & Co..
 No. 1010 line.
 No. 41 line.
 No. 61 line.
 No. 21 line.
Sash, &c.—

Clark's No. 1, \$10; No. 2, \$8 F. gr.
Ferguson's.
Victor.
Walker's.
Attwell Mfg. Co..
Reading.
Hammond's Window Springs.
Common Sense, Jap'd, Cop'd and Br'd.
Common Sense, Nickel Plated.
Universal.
Kempshall's Gravity.
Kempshall's Model.
Corbin's Daisy, list Feb. 15, 1886.
Payson's Perfect.
Hugunin's Sash Balances.
Hugunin's New Sash Locks.
Stoddard's "Practical".
Fves Patent.
Fish (Liesche's pat.), No. 100, \$8 gr.; \$8; No. 106, \$8 gr.
Davis, Bronze, Barnes Mfg. Co..
Champion Safety list January, 1893. 70%
Security.
Giant, list Jan., 1892.
Wolcott's.
Monarch.
Lumber Tools—
 See Tools, Lumber.

Lustro—
 Four-ounce bottles.
 gross.
Machines.

Boring—
 Without Augers. Upright, Angular.
Douglas.
Snell's, Rice's Pat..
Tennings'.
Other Machines.
Phillips' Patent with Augur.
Miller's Falls.
Fluting—

Knox, 1/4-inch Rolls.
Knox, 6-inch Rolls.
Eagle, 3/4-inch Rolls.
Eagle, 5/4-inch Rolls.
Crown, 1/4 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.
Crown Jewel, 6 in.
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.
Domestic Fluter, White Metal.
Geneva Hand Fluter, White Metal.
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00.
Shepard Hand Fluter, No. 85, per doz. \$15.00.
Shepard Hand Fluter, No. 110, F. doz. \$11.00.
Shepard Hand Fluter, No. 95, F. doz. \$8.00.
Clark's Hand Fluter, F. doz. \$15.00.
Combined Fluter and Sad Iron.
McKafe, F. doz. \$10.00.
Hoisting—

Moore's Hand Hoist, with Lock Brake. 20%
Moore's Differential Pulley Block.
Energy's Mfg. Co.'s.
Sure Grip Steel Tackle Blocks.
Washing—

Anthony Wayne, F. doz. No. 1, \$51; No. 2, \$45; No. 3, \$42.
Western Star F. doz. No. 2, \$45; No. 2 \$48.
Woolwell.
Fair and Square.

Mallets—
Hickory.
Lignumvitae.
B. & L. Block Co., Hickory & L. V. 30¢ 30¢ 10%
Mattocks— Regular list. 60¢ 10¢ 60¢ 10%
Measures—

standard Fiberware, No. 1, peck F. doz. \$4; 1/2 peck, \$3.50.

Meat Cutters—
 See Cutters Meat.

Menders, Harness—

Per doz.
Mills—
Coffee—
 Box and Side, List Jan. 1, 1888. 60¢ 10¢ 10%
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, 1893.
 The Swift, Lane Bros.

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Philadelphia.
 Pennsylvania and Continental.
 New Model and Excelsior.
 Other Machines, following net prices:
 10-in. \$3; 12-in., \$3.25; 14-in., \$3.50 each

Muzzles—

F. doz. \$3.00, 25¢

Nails.—

Cut and Wire. See Trade Report.
 Wire Nails Papered.
 Association list, May 1, '92. 80¢ 10¢ 10%
 Tack Mfrs.' list.
 Hungarian, Finishing, &c. See Tacks.

Horse—

No. 6 7 8 9 10
 American.
 Usable.
 40¢ 10¢ 25¢

Clinton, Fin. 19¢ 17¢ 16¢ 15¢ 14¢ 13¢ 10¢ 10%
 Essex.
 40¢ 10¢ 25¢ 50¢ 55¢

Lyra.
 Snowden.
 Vulcan.
 Northwest'n.
 25¢ 25¢ 25¢ 25¢ 25¢

A. C.
 25¢ 25¢ 25¢ 25¢ 25¢ 10¢ 33¢ 4¢ 5%
 C. B. K.
 25¢ 25¢ 25¢ 25¢ 25¢ 33¢ 33¢ 10%
 Maud S.
 40¢ 10¢ 25¢
 Champlain.
 40¢ 5¢ 5¢ 25¢ 25¢

Saranac.
 Champion.
 10¢ 10¢ 10¢ 10¢ 10¢

Capewell.
 19¢ 18¢ 17¢ 16¢ 15¢ 14¢ 13¢ 10¢ 10%
 Anchor.
 25¢ 25¢ 25¢ 25¢ 25¢ 15¢ 15¢ 15¢ 15¢
 Western.
 13¢ 14¢ F. doz.

Picture—

Brass Head, Sargent's list.
 Brass Head, Combination list.
 Porcelain Head, Sargent's list. 50¢ 10¢ 10%
 Porcelain Head, Combination list. 40¢ 10¢ 10%
 Niles' Patent.

Nail Pullers— See Pullers, Nail.**Nail Sets—** See Sets, Nail.**Nut Crackers—**

See Crackers, Nut.

Nuts— List Dec. 18, 1889.

Square, Hex.
 Hot Pressed.
 Cold Punched.
 In packages of 100 lb, add 1-10¢ F. net;
 in packages less than 100 lb, add 1¢ F. net.

Oakum—

Best or Government.
 U. S. Navy.
 Navy.
 5¢ 5¢ 5¢ 5¢

Oilers—

Zinc and Tin.
 Brass and Copper.
 Malleable, Hammer Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 F. doz.

Malable, Hammer's Old Pattern, same list.
 Prior's Pat. or "Paragon" Zinc.
 60¢ 10¢ 10¢

Prior's Pat. or "Paragon" Brass.
 Olmstead's Tin and Zinc.
 Olmstead's Brass and Copper.
 Broughton's Zinc.
 Broughton's Brass.
 Gem, P. D. & Co.
 Steel, Draper & Williams.
 50¢ 50¢ 50¢

Openers Can—

Messenger's Comet.
 American.
 Duplex.
 Lyman's.
 No. 4, French.
 No. 5, Iron Handle.
 N. Y. B. & P. Co.
 Eureka.
 Sardine Scissors.
 Star.
 Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50; 4, \$2.75; 5, \$3.00; 6, \$3.25; 7, \$3.50; 8, \$3.75; 9, \$4.00; 10, \$4.25; 11, \$4.50; 12, \$4.75; 13, \$5.00; 14, \$5.25; 15, \$5.50; 16, \$5.75; 17, \$6.00; 18, \$6.25; 19, \$6.50; 20, \$6.75; 21, \$7.00; 22, \$7.25; 23, \$7.50; 24, \$7.75; 25, \$8.00; 26, \$8.25; 27, \$8.50; 28, \$8.75; 29, \$9.00; 30, \$9.25; 31, \$9.50; 32, \$9.75; 33, \$10.00; 34, \$10.25; 35, \$10.50; 36, \$10.75; 37, \$11.00; 38, \$11.25; 39, \$11.50; 40, \$11.75; 41, \$12.00; 42, \$12.25; 43, \$12.50; 44, \$12.75; 45, \$13.00; 46, \$13.25; 47, \$13.50; 48, \$13.75; 49, \$14.00; 50, \$14.25; 51, \$14.50; 52, \$14.75; 53, \$15.00; 54, \$15.25; 55, \$15.50; 56, \$15.75; 57, \$16.00; 58, \$16.25; 59, \$16.50; 60, \$16.75; 61, \$17.00; 62, \$17.25; 63, \$17.50; 64, \$17.75; 65, \$18.00; 66, \$18.25; 67, \$18.50; 68, \$18.75; 69, \$19.00; 70, \$19.25; 71, \$19.50; 72, \$19.75; 73, \$20.00; 74, \$20.25; 75, \$20.50; 76, \$20.75; 77, \$21.00; 78, \$21.25; 79, \$21.50; 80, \$21.75; 81, \$22.00; 82, \$22.25; 83, \$22.50; 84, \$22.75; 85, \$23.00; 86, \$23.25; 87, \$23.50; 88, \$23.75; 89, \$24.00; 90, \$24.25; 91, \$24.50; 92, \$24.75; 93, \$25.00; 94, \$25.25; 95, \$25.50; 96, \$25.75; 97, \$26.00; 98, \$26.25; 99, \$26.50; 100, \$26.75; 101, \$27.00; 102, \$27.25; 103, \$27.50; 104, \$27.75; 105, \$28.00; 106, \$28.25; 107, \$28.50; 108, \$28.75; 109, \$29.00; 110, \$29.25; 111, \$29.50; 112, \$29.75; 113, \$30.00; 114, \$30.25; 115, \$30.50; 116, \$30.75; 117, \$31.00; 118, \$31.25; 119, \$31.50; 120, \$31.75; 121, \$32.00; 122, \$32.25; 123, \$32.50; 124, \$32.75; 125, \$33.00; 126, \$33.25; 127, \$33.50; 128, \$33.75; 129, \$34.00; 130, \$34.25; 131, \$34.50; 132, \$34.75; 133, \$35.00; 134, \$35.25; 135, \$35.50; 136, \$35.75; 137, \$36.00; 138, \$36.25; 139, \$36.50; 140, \$36.75; 141, \$37.00; 142, \$37.25; 143, \$37.50; 144, \$37.75; 145, \$38.00; 146, \$38.25; 147, \$38.50; 148, \$38.75; 149, \$39.00; 150, \$39.25; 151, \$39.50; 152, \$39.75; 153, \$40.00; 154, \$40.25; 155, \$40.50; 156, \$40.75; 157, \$41.00; 158, \$41.25; 159, \$41.50; 160, \$41.75; 161, \$42.00; 162, \$42.25; 163, \$42.50; 164, \$42.75; 165, \$43.00; 166, \$43.25; 167, \$43.50; 168, \$43.75; 169, \$44.00; 170, \$44.25; 171, \$44.50; 172, \$44.75; 173, \$45.00; 174, \$45.25; 175, \$45.50; 176, \$45.75; 177, \$46.00; 178, \$46.25; 179, \$46.50; 180, \$46.75; 181, \$47.00; 182, \$47.25; 183, \$47.50; 184, \$47.75; 185, \$48.00; 186, \$48.25; 187, \$48.50; 188, \$48.75; 189, \$49.00; 190, \$49.25; 191, \$49.50; 192, \$49.75; 193, \$50.00; 194, \$50.25; 195, \$50.50; 196, \$50.75; 197, \$51.00; 198, \$51.25; 199, \$51.50; 200, \$51.75; 201, \$52.00; 202, \$52.25; 203, \$52.50; 204, \$52.75; 205, \$53.00; 206, \$53.25; 207, \$53.50; 208, \$53.75; 209, \$54.00; 210, \$54.25; 211, \$54.50; 212, \$54.75; 213, \$55.00; 214, \$55.25; 215, \$55.50; 216, \$55.75; 217, \$56.00; 218, \$56.25; 219, \$56.50; 220, \$56.75; 221, \$57.00; 222, \$57.25; 223, \$57.50; 224, \$57.75; 225, \$58.00; 226, \$58.25; 227, \$58.50; 228, \$58.75; 229, \$59.00; 230, \$59.25; 231, \$59.50; 232, \$59.75; 233, \$60.00; 234, \$60.25; 235, \$60.50; 236, \$60.75; 237, \$61.00; 238, \$61.25; 239, \$61.50; 240, \$61.75; 241, \$62.00; 242, \$62.25; 243, \$62.50; 244, \$62.75; 245, \$63.00; 246, \$63.25; 247, \$63.50; 248, \$63.75; 249, \$64.00; 250, \$64.25; 251, \$64.50; 252, \$64.75; 253, \$65.00; 254, \$65.25; 255, \$65.50; 256, \$65.75; 257, \$66.00; 258, \$66.25; 259, \$66.50; 260, \$66.75; 261, \$67.00; 262, \$67.25; 263, \$67.50; 264, \$67.75; 265, \$68.00; 266, \$68.25; 267, \$68.50; 268, \$68.75; 269, \$69.00; 270, \$69.25; 271, \$69.50; 272, \$69.75; 273, \$70.00; 274, \$70.25; 275, \$70.50; 276, \$70.75; 277, \$71.00; 278, \$71.25; 279, \$71.50; 280, \$71.75; 281, \$72.00; 282, \$72.25; 283, \$72.50; 284, \$72.75; 285, \$73.00; 286, \$73.25; 287, \$73.50; 288, \$73.75; 289, \$74.00; 290, \$74.25; 291, \$74.50; 292, \$74.75; 293, \$75.00; 294, \$75.25; 295, \$75.50; 296, \$75.75; 297, \$76.00; 298, \$76.25; 299, \$76.50; 300, \$76.75; 301, \$77.00; 302, \$77.25; 303, \$77.50; 304, \$77.75; 305, \$78.00; 306, \$78.25; 307, \$78.50; 308, \$78.75; 309, \$79.00; 310, \$79.25; 311, \$79.50; 312, \$79.75; 313, \$80.00; 314, \$80.25; 315, \$80.50; 316, \$80.75; 317, \$81.00; 318, \$81.25; 319, \$81.50; 320, \$81.75; 321, \$82.00; 322, \$82.25; 323, \$82.50; 324, \$82.75; 325, \$83.00; 326, \$83.25; 327, \$83.50; 328, \$83.75; 329, \$84.00; 330, \$84.25; 331, \$84.50; 332, \$84.75; 333, \$85.00; 334, \$85.25; 335, \$85.50; 336, \$85.75; 337, \$86.00; 338, \$86.25; 339, \$86.50; 340, \$86.75; 341, \$87.00; 342, \$87.25; 343, \$87.50; 344, \$87.75; 345, \$88.00; 346, \$88.25; 347, \$88.50; 348, \$88.75; 349, \$89.00; 350, \$89.25; 351, \$89.50; 352, \$89.75; 353, \$90.00; 354, \$90.25; 355, \$90.50; 356, \$90.75; 357, \$91.00; 358, \$91.25; 359, \$91.50; 360, \$91.75; 361, \$92.00; 362, \$92.25; 363, \$92.50; 364, \$92.75; 365, \$93.00; 366, \$93.25; 367, \$93.50; 368, \$93.75; 369, \$94.00; 370, \$94.25; 371, \$94.50; 372, \$94.75; 373, \$95.00; 374, \$95.25; 375, \$95.50; 376, \$95.75; 377, \$96.00; 378, \$96.25; 379, \$96.50; 380, \$96.75; 381, \$97.00; 382, \$97.25; 383, \$97.50; 384, \$97.75; 385, \$98.00; 386, \$98.25; 387, \$98.50; 388, \$98.75; 389, \$99.00; 390, \$99.25; 391, \$99.50; 392, \$99.75; 393, \$100.00; 394, \$100.25; 395, \$100.50; 396, \$100.75; 397, \$101.00; 398, \$101.25; 399, \$101.50; 400, \$101.75; 401, \$102.00; 402, \$102.25; 403, \$102.50; 404, \$102.75; 405, \$103.00; 406, \$103.25; 407, \$103.50; 408, \$103.75; 409, \$104.00; 410, \$104.25; 411, \$104.50; 412, \$104.75; 413, \$105.00; 414, \$105.25; 415, \$105.50; 416, \$105.75; 417, \$106.00; 418, \$106.25; 419, \$106.50; 420, \$106.75; 421, \$107.00; 422, \$107.25; 423, \$107.50; 424, \$107.75; 425, \$108.00; 426, \$108.25; 427, \$108.50; 428, \$108.75; 429, \$109.00; 430, \$109.25; 431, \$109

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co.	25¢
Henis.	\$1.35
Shepard's Queen City.	40¢
Silver & Co.	\$2.75

Pruning Hooks and Shears—See Shears.**Pullers Nail—**

Scranton.	7¢ doz.
Curtis Hammer.	7¢ doz.
Giant, No. 1.	18¢ doz.
Giant, No. 2.	15¢ doz.
Pelican.	9¢ doz.
Eclipse.	2.00 net
Economy.	7¢ doz.

Pulleys—

Hot House, Awning, &c.	60¢ to 70¢
Japanese Screw.	60¢ to 10¢ to 10%
Brass Screw.	70¢
Japanese Sheet.	60¢ to 10¢ to 10%
Japanese Clothes Line.	60¢ to 10¢
Moore's Sash, Anti-Friction.	50¢
Hay Fork, Solid Eye, \$4.00.	Swivel, \$4.50.
Hay Fork, "P" Common and Patent.	50¢
Bushed.	20¢
Hay Fork, Tarbox Pat. Iron.	20¢
Hay Fork, Reed's Self-Lubricating.	60¢
Shade Rack.	45¢
Tackle Blocks—See Blocks.	
Moore's Anti-Friction 5 in. Wheel, 7¢ doz.	12.00.
Shepard's Niagara, No. 25.	30¢
Sash (Auger Mortise). C. minon Sense.	60¢
Empire.	60¢
Ideal, Nos. 2, 4, 10 & 15.	60¢ less 1¢ per doz net.
Acme.	
Star.	
One bbl. lots extra 5¢.	
Ideal, Nos. 25 and 55.	7¢ doz. 22¢ net.

Pumps—

Cistern, Best Makers.	.60¢ to .65¢
Pitcher Spout, Best Makers.	.67¢ to .70¢
Pitcher Spout, Cheaper G'd's.	.75¢ to .85¢

Punches—

Baddler's or Drive, good.	7¢ doz.
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check.	40¢
Solid Tinner's, P. S. & W. Co.	1.44
Tinners' Hollow Punches, P. S. & W. Co.	65¢
Rice Hand Punches.	15¢
Avery's Revolving.	40¢
Avery's Sawset and Punch—See Sawsets.	

Rail—

Sliding Door, Wr't Brass.	7¢ lb. 35¢, 40¢
Sliding Door, Bronzed Wr't Iron.	7¢ lb. 7¢
Sliding Door, Iron, Painted.	7¢ lb. 4¢, 40¢
Barn Door, Light. In.	3¢ lb. 3¢
Per 100 feet.	\$2.00 2.50 3.10, 10¢

B. D. for N. E. Hangers—	Small, Med. Large.
Per 100 feet.	\$3.15 2.70 3.25 Net
Terry's Steel Rail.	7¢ ft. 4¢
Victor Track Rail, 7¢ ft.	50¢ to 25¢
Carrier, double braced, Steel Rail, 7¢ foot.	3¢ to 4¢
Moore's Wrought Iron.	25¢
Moody Steel Rail, 7¢ ft.	45¢

Rakes—

Cast Steel, Association g'd's.	70¢ to 75¢
Cast Steel, outside g'd's.	70¢ to 75¢ to 85¢
Malleable.	70¢ to 75¢
Gibbs' Lawn Rake.	7¢ doz. 4.90
Gibbs' Canton Lawn Rake.	7¢ doz. 3.75
Gibbs' Acme Lawn Rake.	7¢ doz. 4.75
Gibbs' Favorite Lawn Rake.	7¢ doz. 3.90
Gibbs' Crown Lawn Rake, No. 1.	7¢ doz. \$4.90; No. 2, 2.35 40¢
Onida Lawn Rake.	7¢ doz. 6.00
Fort Madison Prise Bow, Brake and Peerless.	65¢
Fort Madison Steel Tooth Lawn Rake.	25¢

Razors—

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher.	\$10 to £1.
Jordan's AAAI, new list.	Net
Jordan's Old Faithful, new list.	Net
Galvanic.	7¢ doz. \$15.00
Electric Cutlery Co.	Net
Campbell Cutlery Co.	50¢

Razor Straps—See *Straps, Razor.***Rings and Ringers—****Bull Rings—**

Union Nut Co.	55¢
Sargent's.	75¢ to 10¢
Hotchkiss, low list.	20¢
Humason, Becker & Co.'s.	70¢ to 10¢
Peck, Stow & W. Co.'s.	50¢ to 10¢ to 50¢ to 10%
Ellrich Hdw. Co., White Metal, low list.	50¢ to 80¢ to 10¢

Hog—

Top of the Hill Ringers.	7¢ doz. \$2.00
Top of the Hill Rings.	7¢ doz. \$1.25
Hill's Improved Ringers.	7¢ doz. \$1.25
Hill's Old Style Ringers.	7¢ doz. \$1.25
Hill's Tongs.	7¢ doz. 1.00
Hill's Rings.	7¢ doz. 1.00
Perfect Rings.	7¢ doz. box 4.50
Perfect Ringers.	7¢ doz. 2.15 to 2.25
Blair's Hog Rings.	7¢ doz. 90¢ to 1.00
Champion Rings.	7¢ doz. 2.25
Champion Rings, Double.	7¢ doz. 2.25
Brown's Rings.	7¢ doz. 2.25
Brown's Rings.	7¢ doz. 1.15 to 2.25
Electric Hog Rings.	7¢ doz. boxes 4.50
Electric Hog Ringers.	7¢ doz. 2.25
Major Rings.	7¢ doz. 6.25
Major Ringers.	7¢ doz. \$2.00

Rivets and Burrs—

Iron, list Nov. 17, '87.	60¢ to 10¢
Copper.	60¢ to 60¢ to 10¢
Coppered Iron, Bettina Brand.	40¢

Rivet Sets—See *Sets, Rivet.***Rods—**

Stair, Brass.	25¢ to 30¢
---------------	------------

Rollers—

Barn Door, Sargent's list.	60¢ to 10¢ to 10%
Acme Moore's Anti-Friction.	55¢
Upton Barn Door Roller.	70¢

Rope— The following prices are f.o.b. New York or factory, and are shaded $\frac{1}{2}$ on large lots; terms, 1/4 % for cash.

Manila, 7-10 in. diam. and larger.	7¢ lb.
Manila.	5¢ lb.
Manila, 14 and 16 in.	7¢ lb.
Manila, Tarred Rope.	7¢ lb.
Manila, Hay Rope.	7¢ lb.
Sisal, 7-16 inch and larger.	7¢ lb.
Sisal.	5¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.
New Zealand, Hay Rope.	7¢ lb.
New Zealand, Tarred Rope.	7¢ lb.
Cotton Rope.	7¢ lb.
Jute Rope.	7¢ lb.

Sisal.	7¢ lb.
Sisal, 14 and 18 in.	8¢ lb.
Sisal, Hay Rope.	7¢ lb.
Sisal, Tarred Rope.	7¢ lb.
Sisal, Medium Lath Yarn.	7¢ lb.
New Zealand, 7-10 in. & larger.	6¢ lb.
New Zealand, 14 and 16 in.	7¢ lb.</

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
I. X. L. Whalebone Driving.	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone.								
American Standard.	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.	6.00	6.00	6.50	7.00	7.50	9.00		
New name Stocked Java, Black and White Colors.								
Americus, 95 Pen Whip.								
Gents' Light Driving No. 113.								
Gents' Light Driving No. 106.								
Hanover Stocked Java No. 103.								
A large variety of cheaper grades.								
Team Whips.								
Toy Whips.								
Hardware Assortment, 10/American, 75 Whips for \$60.00.								

Per dozen.

Malin's An'aled & Tin'd on Spools.	6@25
Malin's Brass and Cop, on Spools.	50@5%
Tate's Spooled, Tin'd & Annealed.	60@5%
Tate's Spooled Cop, and Brass.	50%
Cast Steel Wire.	50%
Stubs' Steel Wire.	36.00 to £ 205
Steel Music Wire, 12 to 30, imported.	60@70@70
Wire Clothes Line, see Lines.	
Wire Picture Cord, see Cord.	
Bright Wire Goods—	
Standard list.	80@20@85%
Wire Cloth and Netting—	
Painted Screen Cloth, good quality.	100 sq. ft., \$1.40
Galvanized Wire Netting.	75@75@10%
Wire, Barb—	
See Trade Report.	
Wire Rope—See Rope, Wire.	
Wrenches—	
American Adjustable.	40%
Baxter's Adjustable "S".	40@10@5%
Baxter's Diagonal.	60%
Cox's Genuine.	50@5%
Cox's "Mechanic".	50@10@5%
Girard Standard.	65@10@70%
Lamson & Sessions' Engineers.	60@10%
Lamson & Sessions' Standard.	70@10%
P. S. & W. Agricultural.	75@10@80%
Girard Agricultural.	75@10@80%
Lamson & Sessions' Agric'l.	75@10@80%
Wringers, Clothes—	
Am. Wringer Co.'s list, Jan. 2, 1893.	25 cash
Colby Wringer Co., list Sept. 1, 1892.	25 cash
Lovell Mfg. Co., list Jan. 1, 1892.	25 cash
Pearless Mfg. Co., list Feb. 1892.	25 cash
National Wringer & Mfg. Co., list June 1, 1892.	25 cash
Wrought Goods—	
Staples, Hooks, &c., list March 17, 1892.	55@10@85@15%

Wire and Wire Goods—**Iron—**

Market,	
Br. & Ann., Nos. 0 to 18.	
75@10@75@10@5%	
Cop'd., Nos. 0 to 18.	
75@5@70@10@5%	
Galv., Nos. 0 to 18.	
70@5@70@10@5%	
Tin'd., Tin'd., list, Nos. 0 to 18.	
70@5@70@10@5%	

Stone,	
Br. and Ann'd., Nos. 16 to 18.	80%
Bright and Ann'd., Nos. 19 to 26.	80@5@5%
Br. and Ann'd., Nos. 27 to 36.	Extra 10% often given.
Tinned.	82@4@6@10%
Tinned Broom Wire, 18 to 21.	4@10@4%
Galvanized Fence.	75@10@5%
Brass, list Jan. 18, 1884.	40@5@5%
Copper, list Jan. 18, 1884.	40@5@5%
Annealed Wire on Spools.	60%

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw, per gal.	4@ 4
Linseed, City, boiled.	5@ 5
Linseed, Western, raw.	4@ 4
Lard, City, Extra Winter.	1.02 @1.05
Lard, City, Prime.	1.00 @1.05
Lard, City, Extra No. 1.	.75 @ .80
Lard, City, No. 1.	.60 @ .65
Lard, Western, prime.	1.00 @ .80
Cotton-seed, Crude, prime.	5@ 5
Cotton-seed, Crude, off grades.	53 @ 54
Cotton-seed, Summer Yellow, prime.	61 @ 62
Cotton-seed, Summer Yellow, off grades.	50 @ 60
Sperm, Crude.	95
Sperm, Natural Spring.	..
Sperm, Natural Winter.	95 @ 97
Sperm, Bleached Winter.	1.00 @ 1.02
Whale, Crude.	..
Whale, Natural Winter.	..
Whale, Bleached Winter.	..
Whale, Extra Bleached.	57 @ 58
Sea Elephant, Bleached Winter.	..
Menhaden, Crude, Sound.	40 @ ..
Menhaden, Crude, Southern.	40 @ 42
Menhaden, Light Pressed.	40 @ 43
Menhaden, Bleached Water.	45 @ 45
Menhaden, Extra Bleached.	40 @ 48
Tallow, City, prime.	70 @ 75
Tallow, Western, prime.	65 @ 70
Cocoanut, Ceylon.	64@ 65
Cocoanut, Cochinchina.	7 @ 7
Cod, Domestic.	38 @ 40
Cod, Foreign.	40 @ 45
Red Elaine.	40 @ 45
Red Saponified.	8@ 7@ 7@
Bank, per gal.	40 @ ..
Strait.	41 @ ..
Olive, Italian, bbls.	65 @ 70
Neatsfoot, prime.	70 @ 80
Palm, prime, Lakos.	6 @ 6@ 6@

Paints and Colors—

Barytes, Foreign, 10 ton.	\$22.00
Barytes, Amer. floated.	29.00
Barytes, Amer. No. 1.	16.00
Barytes, Amer. No. 2.	13.00
Barytes, Amer. No. 3.	11.00
Blue, Celestial.	6 @ 8
Blue, Chinese.	40 @ 40
Blue, Prussian.	25 @ 40
Blue, Ultramarine.	8 @ 25
Brown, Spanish.	3@ 1
Brown, Vandyke, Amer.	3 @ 8
Brown, Vandyke, English.	6 @ 8
Carmine, No. 40, in bulk.	3.10 @ ..
Carmine, No. 40, in boxes or barrels.	3.20 @ ..
Carmine, No. 40, in ounce bottles.	4.20 @ ..
Chalk, in bulk.	1.75 @ ..
Chalk, in bbls. 100 lb.	33 @ 40
Chin Clay, English.	1.75 @ ..
Cobalt Oxide, prep'd.	9.00 @ 11.00
Cobalt Oxide, black.	lots 100 lb. 1.90 @ ..
Cobalt Oxide, black.	less 100 lb. 1.96 @ ..
Green, Paris, in bulk.	10 @ 10@ 10%
Green, Paris, small pack.	12 @ 17
Green, Chrome, ordinary.	6 @ 12
Green, Chrom', pure.	22 @ 25
Lead, Eng., B.B. white.	8@ 10
Lead, Ann. White, dry or in oil.	Kegs, lots less than 500 lb. 7 @ 7@
	Kegs, lots 500 lb. to 5 tons. 6@ 6@ 6@
	Kegs, lots 5 tons to 12 tons. 6@ 6@ 6@
	Kegs, lots 12 tons and over. 6@ 6@ 6@
Lead, White, in oil, 25 lb. tin pails, add to keg price.	.. @ ..
Lead, White, in oil, 12½ lb. tin pails, add to keg price.	.. @ ..
Lead, White, in oil, 10 lb. tin pails, add to keg price.	.. @ ..
Lead, White, in oil, 1 to 5 bbls, sorted lots, add to keg price.	.. @ 2½
Lead, Red, bbls. and ½ bbls.	6 @ 7
Lead, Red, kegs.	6@ 7@ 7@
Litharge, reg'd.	6@ 7@ 7@
Litharge, bbls. and ½ bbls.	6 @ 7

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2½% discount for cash if paid within 15 days of date of invoice.	
Ocher, Rochelle.	1.35 @ 1@
Ocher, French Washed.	1.4@ 2@
Ocher, German Washed.	1.4@ 3@
Ocher, American.	1.4@ 1@
Orange Mineral, English.	8@ 9@
Orange Mineral, French.	10 @ 10@
Orange Mineral, German.	8@ 9@ 9@
Orange Mineral, American.	8@ 9@ 8@
Paris White, English Cliff stone.	1.00 @ 1.15
Paris White, American.	65 @ 75
Red, Indian, English.	5@ 6@ 7
Red, Indian, American.	5@ 6@ 6@
Red, Turkey.	9 @ 14
Red, Tuscan.	9 @ 11
Red, Venetian, American.	100 @ 1.00 @ 1.10
Red, Venetian, English.	1.20 @ 1.35
Sienna, Italian, Burnt and Powd.	4 @ 5
Sienna, Italian, Burnt, Imps.	1@ 2@ 3@
Sienna, Italian, Raw, Powd.	4@ 5@ 5@
Black, Lampblack, Best.	20 @ 25
Black, Lampblack, Common.	7 @ 10
Black, Ivory.	8 @ 15
Blue, Chinese.	35 @ 40
Blue, Prussian.	20 @ 25
Blue, Ultramarine.	12 @ 18
Brown, Vandyke.	7 @ 12
Green, Chrome.	8 @ 12
Green, Paris.	16 @ 18@
Sienna, Raw.	7 @ 14
Sienna, Burnt.	7 @ 14
Umbre, Raw.	7 @ 10
Umbre, Burnt.	7 @ 10
Putty—	
In barrels and ½ bbls.	.01@ .01@
In tubs.	.01@ .01@
In tin cans.	.01@ .01@
In bladders.	.01@ .01@
Spirits Turpentine—	
In regular bbls.	.. @ 35@
In machine bbls.	.. @ 35@
Clue—	
Low Grade.	.. @ ..
Cabinet.	12 @ 14
Medium White.	13 @ 15
Extra White.	17 @ 20
French.	10 @ 12
English.	10 @ 12
Irish.	12 @ 13

Have More
New Patented
Improvements
Than Any Other
Freezers
All Inside
Parts
Tinned

Shepard Hdw Co.
Buffalo N.Y.
Sole Makers

"THEY COME UP"
To Every
Expectation.

Freeze The
Quickest
And Run The
Easiest
Cedar Tubs
Extra Strong.



Shepard's Lightning Freezers

Pacific Coast Representatives, CHAS. L. PIERCE & CO., 202 Market St., SAN FRANCISCO, CAL.
Canadian Representative, H. D. SIMMONS, 85 York St., TORONTO, ONT.

CURRENT METAL PRICES.

FEBRUARY 15, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

**IRON AND STEEL—
Bar Iron from Store—**

Common Iron:
1/4 to 2 in. round and square... 1/2 in. 1.00 @ 2.00
1 to 6 in. x 3/4 to 1 in.... 1/2 in. 2.00 @ 2.10
Refined Iron:
1/4 to 2 in. round and square. 1/2 in. 2.00 @ 2.10
1 to 6 in. x 3/4 to 1 in.... 1/2 in. 2.20 @ 2.30
1 to 6 in. x 3/4 to 1 in.... 1/2 in. 2.10 @ 2.20
Rods—1/4 and 11/16 round and sq. 1/2 in. 2.10 @ 2.20
Bands—1 to 8 x 3/16 to No. 12. 1/2 in. 2.30 @ 2.40
"Burden Best" Iron, base price. 1/2 in. 3.00
Burden's "H. B. & S." Iron, base price. 1/2 in. 2.80
"Ulster"..... 1/2 in. 3.00
Norway Bars..... 3.75 @ 4.00
Norway Shapes..... 4.50 @ 5.00

Merchant Steel from Store—

Open-Hearth and Bessemer Machinery, Too Calk, Tire and Sleigh Shoe, base price in small lots.....	23¢
Best Cast Steel, base price in small lots.....	8¢
Best Cast Steel Machinery, base price in small lots.....	5¢
Sheet Iron from Store—	
Black—	
Common R. G. Cleaned American. American.	
Nos. 10 to 16..... 1/2 in. 24¢	...
17 to 20..... 1/2 in. 3¢	...
21 to 24..... 1/2 in. 34¢	...
25 and 26..... 1/2 in. 34¢	...
27..... 1/2 in. 34¢	...
28..... 1/2 in. 34¢	...
American B. B..... 1/2 in. 44 @ 45¢	...
Russia, Planished, &c.	
Genuine Russia, according to assortment..... 1/2 in. 12¢ @ 13¢	...
Patent Planished..... 1/2 in. A, 10¢; B, 9¢	...
Craig Polished Sheet Steel..... 1/2 in. 8¢	...
Galvanized.	
Nos. 10 to 16..... 1/2 in. B. B. 4.20¢	...
17 to 22..... 1/2 in. 4.20¢	...
23 to 24..... 1/2 in. 4.20¢	...
25 to 26..... 1/2 in. 5¢	...
27..... 1/2 in. 54¢	...
28..... 1/2 in. 54¢	...
29 to 30..... 1/2 in. 62¢	...

English Steel from Store—	
Best Cast..... 1/2 in. 15¢	...
Extra Cast..... 1/2 in. 16¢ @ 17¢	...
Swaged, Cast..... 1/2 in. 16¢	...
Best Double Shear..... 1/2 in. 15¢	...
Blister, 1st quality..... 1/2 in. 12¢	...
German Steel, Best..... 1/2 in. 10¢	...
2d quality..... 1/2 in. 9¢	...
3d quality..... 1/2 in. 8¢	...
Sheet Cast Steel, 1st quality..... 1/2 in. 15¢	...
2d quality..... 1/2 in. 14¢	...
3d quality..... 1/2 in. 12¢	...
R. Musket's "Special"..... 1/2 in. 48¢	...
" " " Titenic"..... 1/2 in. 75¢	Annealed.

METALS—
Tin—

Per lb.
Banca, Pigs..... 22¢
Straits, Pigs..... 21¢
Straits in Bars..... 23¢

Tin Plates—
Duty: 22¢ $\frac{1}{2}$ lb.

Charcoal Plates—Bright—
Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade, IC, 10 x 14. @ \$6.50

" " " " IC, 12 x 12. @ 6.75

" " " " IC, 14 x 20. @ 6.50

" " " " IC, 20 x 28. @ 12.00

" " " " IX, 10 x 14. @ 8.50

" " " " IX, 12 x 12. @ 8.75

" " " " IX, 14 x 20. @ 8.50

" " " " IX, 20 x 28. @ 17.00

" " " DC, 12 x 17. @ 6.00

" " " DX, 12 x 17. @ 8.00

Allaway Grade..... IC, 10 x 14. @ 6.00

" " " IC, 12 x 12. @ 6.25

" " " IC, 14 x 20. @ 6.00

" " " IC, 20 x 28. @ 12.00

" " " IX, 10 x 14. @ 7.50

" " " IX, 12 x 12. @ 7.75

" " " IX, 14 x 20. @ 7.50

" " " IX, 20 x 28. @ 15.00

" " " DC, 12 x 17. @ 5.50

" " " DX, 12 x 17. @ 7.00

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14, 14 x 20. @ \$5.50

10 x 20. @ 8.50

20 x 28. @ 11.50

IX, 10 x 14, 14 x 20. @ 7.00

BV Grade.—IC, 10 x 14, 14 x 20. @ 5.60

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC, 14 x 20. @ \$5.75

20 x 28. @ 11.00

IX, 14 x 20. @ 6.50

20 x 28. @ 13.00

Abecarne Grade.—IC, 14 x 20. @ 5.65

20 x 28. @ 11.00

IX, 14 x 20. @ 6.50

20 x 28. @ 13.00

Tin Boiler Plates—

XX, 4 x 20. @ \$13.35

XXX, 14 x 20. @ 14.50

XXX, 14 x 31. @ 16.00

American Terne Plates—Apollo.

IC, 14 x 20. @ 6.25

IC, 20 x 28. @ 12.50

IX, 14 x 20. @ 7.25

IX, 20 x 28. @ 14.50

Copper—

DUTY: Pig, Bar and Ingot, 1/4¢; Old Copper, 1¢ $\frac{1}{2}$ lb. Manufactured (including all articles of which Copper is a component or chief value), 35% ad valorem.

Ingot—

Lake. @ 13¢
Ansonia grade Arizona. @ 12¢
Ansonia grade Casting. @ 12¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 18, 1892. Subject to a discount of 15% @ 25%, according to size of order.

Weights per sq. foot and prices per pound.

Not wider than	Over 64 oz.	64 to 32 oz.	32 to 16 oz.	16 to 8 oz.	8 to 4 oz.	Less than 4 oz.
30	72	24	12	6	3	1
30	72	24	12	6	3	1
36	96	24	12	6	3	1
48	96	24	12	6	3	1
60	96	24	12	6	3	1
60	96	24	12	6	3	1
84	96	24	12	6	3	1
84	96	24	12	6	3	1
Ov'r 84 in. wide	25	27	—	—	—	—

Bolt Copper, 1/4 inch diameter and over, per pound. 2¢

Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ $\frac{1}{2}$ lb. to advance over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ $\frac{1}{2}$ lb. to advance over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ $\frac{1}{2}$ lb. to advance over prices of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. $\frac{1}{2}$ square foot and heavier, 1¢ $\frac{1}{2}$ lb. over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. $\frac{1}{2}$ square foot, 2¢ $\frac{1}{2}$ lb. over the foregoing prices.

All Polished Copper over 20 in. wide, 2¢ $\frac{1}{2}$ lb. to advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

Per lb.

14 ounce to square foot and heavier. 2¢

12 ounce and up to 14 ounce to square foot. 2¢

10 ounce and up to 12 ounce. 2¢

Lighter than 10 ounce. 2¢

Circles less than 8 inches diameter, 2¢ $\frac{1}{2}$ lb. additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

10% @ 20% discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned. @ 10¢ @ 12¢

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each. 8¢

Tinning sheets on one side, 30 x 60 each. 3¢

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each. 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each. 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each. 12¢

Tinning sheets on one side, other sizes, per square foot. 2¢

For tinning both sides double the above prices.

Plated Brass and Copper—

Not larger than 30 x 60.

16 oz. @ 2¢ $\frac{1}{2}$ lb.

14 oz. @ 2¢ $\frac{1}{2}$ lb.

12 oz. @ 2¢ $\frac{1}{2}$ lb.

Net.

Seamless Brass Tubes—

July 6, 1892.

Net.

O. G. N. G. 3¢ 4¢ 5¢ 6¢ 7¢ 8¢ 1¢ 1¢

8-14 6-12 22 28 25 24 23 22 19

15 13 33 28 26 25 24 23 20

16 14 34 29 27 26 25 24 21

17 15 35 30 28 27 26 25 21

18 16 37 31 29 27 26 25 22

19 17 38 32 30 29 28 27 24

20 18-19 39 34 32 31 30 29 26

21 20 41 36 34 33 32 31 29

22 21 43 37 35 34 33 32 31

23 22 45 39 37 36 35 34 33

24 23 48 41 39 38 36 35 34

25 24 51 44 41 40 39 38 40

Copper, Bronze and Gilding Tube, 3¢ $\frac{1}{2}$ lb. additional.

Brazed Brass Tubing. To No. 20 inclusive. 3¢

Above 5 1/2 in. to 8 in. inclusive. 3¢

Plain, 3 1/2 in. 3¢

Plain, 1/2 in. 3¢

Plain, 3/16 in. 3¢

Plain, 1/4 in. 3¢

Fancy Tubing, Brass, to No. 20, inclusive. 3¢ $\frac{1}{2}$ lb.

Bronze Tubing, 3¢ $\frac{1}{2}$ lb. more than Brass. 3¢ $\frac{1}{2}$ lb.

Discount from list. 30% @ 1/2

Common High Brass: In. 2 3 4 5 6 7 8 9 10

Wider than and including 10 12 14 16 18 20 22 24

To No. 20, inclusive. 21 22 23 24 25 27 31 33

Nos. 21, 22, 23 and 24. 22 23 24 26 28 30 32 34

Nos. 25 and 26. 22 23 24 26 28 30 32 34

Nos. 27 and 28. 23 24 25 27 29 31 33 36

To No. 20, inclusive. 21 22 23 24 25 27 31 33

Nos. 21, 22, 23 and 24. 22 23 24 26 28 30 32 34

Nos. 25 and 26. 22 23 24 26 28 30 32 34

Nos. 27 and 28. 23 24 25 27 29 31 33 36

Common High Brass: In. 2 3 4 5 6 7 8 9 10

Wider than and including 10 12 14 16 18 20 22 24</p